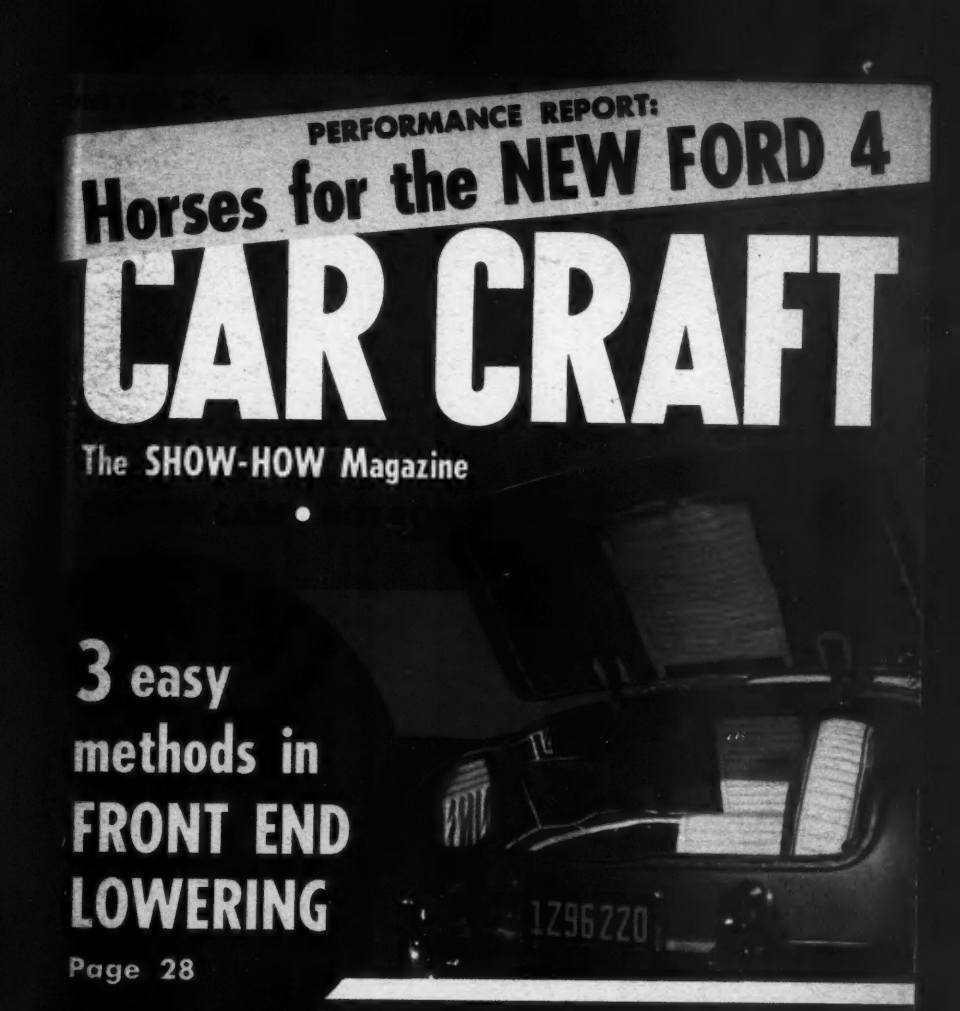
PERFORMANCE REPORT:

Horses for the NEW FORD 4

CAR CRAFT

The SHOW-HOW Magazine



3 easy methods in FRONT END LOWERING

Page 28

SENSATIONAL CUSTOM OLDS

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CAR CRAFT

Vol. 2 No. 2

Published Monthly

The Show-How Magazine

Robert E. Petersen, Publisher
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Wally Parks, Editorial Director
Ted Johnson, Business Manager
John Christy, Editor
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COVER

Bill Gaylord is probably best known for those plushy interiors sported by many of the better customs and roadsters around the Southern California area. After dolling up other folks' cars for far too long a time, Bill decided that he, too, could have a custom. The story of how he swapped his needle for a hammer and torch starts on page 32. *Ektachrome by Medley*

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"CISCO" says:

WHAT can you tell the fellow who drives a make of automobile, not normally considered suitable for such goings on, when he asks you if he should "hop up" the engine in his car? Perhaps the best thing to do in this case is answer a question with a question: Why do you want to hop up your engine?

A point that must be considered before any time or money is spent on an engine to improve its performance characteristics, unless it is one of the old standbys, is the adaptability of the engine to higher horsepower output. Do its crankshaft and rod and piston assemblies have sufficient strength to stand up under the higher cylinder pressures and rotating speeds required of a hot engine? Are its reciprocating parts—its connecting rods and pistons—too heavy for high engine speeds? Does it have suitable valve and port areas, or possibility of enlarging existing areas to make them suitable, to develop a high horsepower output? And another point, are special engine parts readily available—readily available special parts make any job of this type easier, although a few fellows have the facilities and are entirely capable of making their own parts.

To the fellow who merely wants to increase his driving enjoyment, we can only say, "Go ahead, give your engine a mild conversion treatment, if it is adaptable, and enjoy yourself."

To the fellow who wants to enter his car in some type of competition, our answer will depend on the specific type of competition: Is he going to compete only against automobiles of the same make as his own, or is he going to run in a class, as determined by engine displacement? If he is going to compete against automobiles similar to his own, our answer is yes, do everything possible, within competition rules, to increase the engine's output. If the engine is not too adaptable, don't despair—the other owners against whom you will be competing are in the same boat. On the other hand, if the plan is to compete in a specific displacement class, weigh your engine's features carefully against those you may have to run against. If your engine does not balance favorably with those of the competition, it would be advisable to trade it for one that does.

To the fellow who wants to take on all comers, we must recommend, above all, the application of a little common sense to the problem—don't expect a "well-hotted" MG to out-accelerate an Olds 88 because it won't do it.

If your relatively small engine is in a light chassis, and the fellow you are running against has a big engine, but in a heavy chassis, it's possible that the ratio of pounds of vehicle weight for each horsepower developed by the engines could be in your favor. Horsepower-to-weight ratio is one of the main factors in an acceleration contest; however, as vehicle speed increases, wind resistance, as determined by the frontal area of the vehicle, also increases until it eventually reaches a point where it has a greater influence than weight on the performance of the vehicle.

To say definitely that one engine is ideal for hopping up and that another is not at all applicable is not only a bit foolish but also practically impossible. But if you have an engine that doesn't quite fit into the scheme of things, trod carefully—being a pioneer is often a long, expensive project.

Don Francisco

BRIEF AND TO THE POINT:

271 Words From the Editor

We received a letter not too long ago in which the writer waxed a bit delirious about Young Henry's newest product, the two new Ford Fours. What he didn't know was that we were just as het up about the new four barrels as he was—in fact we already had our spies at work. The results of that piece of espionage, as we promised a month ago, are on the 10 pages beginning with Chuck Eddy's story on page 16 and winding up with the start of Les Nehamkin's photo Show-How feature on page 22. One thing you'll find is that there have been a few misconceptions conceived by less informed writers who leaped before they looked. If you've been discouraged by one or more of these hasty lads, read on, friend, and have your fear laid to rest.

And speaking of letters, never fear—CAR CRAFT will never go pin-up. We just thought the lad that liked girls (CC, April '54, *Letters*) had a right to get up and speak his piece. If he likes girls he likes girls; as for us we like em too but not to the exclusion of automobiles. So Peace, fellows.

As some of you may have gathered from the last issue, we're a little excited over this trials kick. To us trials seem to be the answer to many problems, especially with the buck getting a bit tight. On pages 38 through 43 we've laid out a complete list of suggestions on how your club, group or crowd can put on a trials meet anywhere, any time.

So, have a ball.

THINGS TO COME

IN line with the trials mentioned above, we've got a goodie coming up. This will be a fair sized piece on how you can stuff a car together for this kind of bash and what's more how you can do it on a slim budget. Nice thing about it is that you don't have to spend a fortune for a real hairy trials buggy. As far as we can tell, it's the least expensive form of competition going.

Of course, we won't forget the Ford Four with just one blast, either. Next month we'll pass on the rest of the dope on carbureting the little bear for top torque. You'll be able to improvise and make your own set-ups too. What with the competition season coming on full swing we'll be able to pass on quite a bit of real going equipment to you. F'rinstance: Do you know how a quick change rear end can be stuffed together without a lot of grief, sweat and pounding? We'll show you. Think such things as the McDowell, Miller-Schofield and Cragar Model A conversions are dead pigeons? Stick around. Chuck Eddy's got a few little things lined up, too, so don't go away. Remember, Summer's for reading as well as riding.

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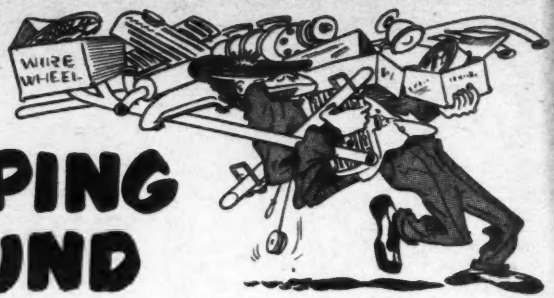
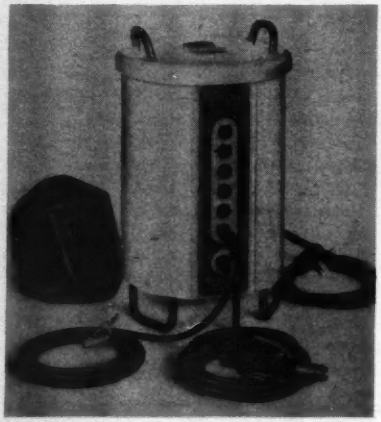


SHOPPING AROUND

ARC WELDER

AN inexpensive "utility" A. C. Arc Welder, especially designed for non-professional use in farm and home workshops, is being introduced this spring. Retailing at $169.95, this Redi-Arc welder readily handles up to 5/32 electrodes, and can be used wherever 220 V, 60 cycle, single-phase current is available. The Redi-Arc is claimed to have



the highest usable capacity possible in a unit of its size and rating, yet its input demand is well within the limits of a regular 3 KVA line transformer.

The welder equals or exceeds NEMA and REA specifications, according to the manufacturer. For more information, write Marquette Manufacturing Co., Inc., 307 E. Hennepin Avenue, Minneapolis 14, Minn.

COMPRESSION GAUGE

TESTING equipment gets bigger and better day by day. Here's one of the latest, a compression gauge that makes a permanent record, cylinder by cylinder, of the compression of your engine. Nice thing about it is that you can keep a record before, during and

after rebuilding to show each degree of improvement. By periodic checks the gauge gives you an accurate record of engine wear. Called the MoTest, Model 285, it's available from Fisher Products Dept. CC, 2121 44th Drive, Long Island City 1, New York.

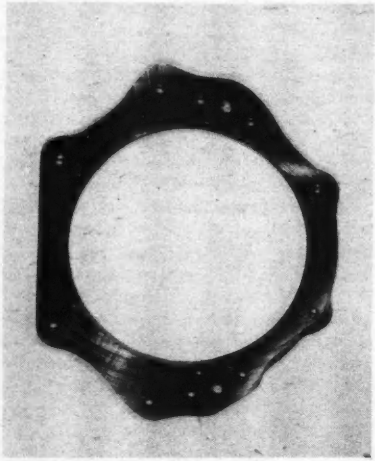
KEY SAFE

IF you're one of those people who always remember numbers and who always forget where you left your car keys, this piece of equipment may be just the ticket. It's a small but sturdy combination safe just large enough to hold one automobile key. A U-bolt, similar to and acting like the U on a padlock, allows the safe to be locked onto any convenient spot on your car. The man-

ufacturer says it's completely weather proof and rattle free. Lock comes with two copies of the combination for about $10 from The Key Safe, 707 Stephenson Building, Detroit 2, Mich.

CAD-FORD ADAPTER

HERE'S a neat item that we've been getting requests about. It's an adapter plate for buckling the Olds and Cadillac powerhouses up to the Ford and Merc transmissions. With this little goodie you can stuff all the



horses you can use into your Ford product without a lot of grief. The item is manufactured by Wilcap Automotive, 10215 South San Pedro, Los Angeles, Calif.

CRAZY LETTERS

HERE'S the newest thing for making those crazy bumper slogans. These 1½ inch letters are made of genuine Scotch light, protecting your car at night as well as attracting attention. Use for initials, names, advertising or just to be funny. Also for house numbers, mail boxes or any reflective sign. Purchase in any assortment, either red or silver, at 10 cents per letter, 12 for $1.00. Nice display unit for dealers and jobbers. Sales representatives' areas open. Write: Stylized Emblem Company, 1356 N. Western Ave., Los Angeles 27, Calif.

CAR-FRESH

CAR-FRESH keeps any car smelling fresh and new. Simply spray the interior of any car, upholstery, floor mats, ash trays, etc. The results are immediate, all unpleasant odors are gone, tobacco, dampness, pets, etc. That "showroom scent" will come back to your

car. Comes in easy-to-use non-breakable plastic spray bottle. One bottle will last the average car owner over six months. Satisfaction guaranteed or money back. $1.00 postpaid. Lorraine Products, Dept. CG, 512 Olive Street, Lorain, Ohio.

LETTERS

WE DIG 'EM ALL

Dear Sirs:

I have just read your magazine from cover to cover as I do faithfully each and every month. I have read the correspondence part, noting with interest that quite a few people seem to want more articles on sports cars. Your magazine clearly states on the cover—Custom Cars and Hot Rods. For this reason I and many of my friends were first attracted to it. I sincerely hope that you do *not* print articles on sports cars and drop some of your fine work on custom cars. I can not say truthfully that I have liked all of your articles on custom cars, and I think you should have more articles on customs built by teen-agers. These kids have worked hard to receive recognition of their work, and received little, I think, compared to what they deserve.

The people I have talked to here, seem to prefer the name HONK! to that of CAR CRAFT.

Your little magazine is doing great in helping us with our cars. Keep up the good work in "Torch Tips."

Sincerely,
"Al"

Custom cars, hot rods, sports cars, hill-climb cars, trials buggies . . . Man, they're ALL the MOST! We dig 'em all. That's why we're in this business.—ED.

HI-LIFT ROCKERS

Dear Sirs:

I would like your explanation on a small, but important part of the ohv engine.—This being the high lift rocker arm.

I would like to know whether or not someone is making some easy money or do they really work as advertised?

They say you get 1/16 of an inch more gap over the stock arm, also more speed and acceleration. —Is this so?

We have figured out one way they could possibly work.

Thank you,
Leroy Boyd
Oregon City, Ore.

High lift arms have in the past been successful only on Chevrolets. Some are now being developed for the '54 Ford and Mercury V8 and for the six.—ED.

HENRY J

Dear Sirs:

Can you please tell me what the advantages are in changing from a two-bolt to a three-bolt carb?

At present I own a '51 Henry J (6-cyl) and would like to know if such a change would affect it in any way.

Can you tell me how to give the present mill a boost without too much expense? I will appreciate any information on this matter.

Gratefully yours,
Stanley Saunders
South Norwalk, Conn.

P.S. I read your magazine and like it very much. Sometimes I read the same copy two or three times. I have read it since it first came out. Keep it coming. It's great!

Stan

A larger carburetor would only give you

overcarburetion if used on a stock manifold. We suggest you write to one of the larger speed equipment houses for a list of equipment for your car.—ED.

WE'RE HAPPY TOO

Dear Sirs:,

First of all, I would like to thank you for the fine magazine you put out; it's tops!

I'm a "T" man, myself, and an all out competition fan, which I like very much to see in your magazine. I know there are many others who thrive on customs as much as I do on competition, and thanks to a swell magazine we're all happy.

I would like very much to say to the people who think like "Girly Guy" (page 66, April '54); this magazine is the *Automotive Show-How*. If these people want girls, I'm sure the newsstand can supply them with this type of material. They just have the wrong book, that's all.

I'm a member of the "Derbys" of Corpus Christi, and of the "Gulf Coast Timing Assn." here in Texas.

I am now building a '27 "T" which I have chopped 13 inches and am about ready to channel it 8 inches over "A" rails. The rails have front and rear suicide suspension, tube front axle, and Franklin center steering; what do you think?

Keep up the good work and you'll keep the true automotive enthusiast happy. The only change to the magazine to make it better would be more of it.

Thanks a lot,
Bob Soutar
"Derbys," Corpus Christi, Texas

P.S. Comment on page 9, April '54, re: Harvey Bott; J. C. Williams, W. L. Spackler, and other critics. It sure made me happy to see your letter and I don't think that it could have been put over better.

"Derbys"

WHO, US?

Dear Sirs:

I have just finished reading the March '54 issue of CAR CRAFT, and I want to commend you on your fine work. CAR CRAFT not only has interesting features, but explains them in a way so that the average individual interested in automobiles can comprehend them with a fair degree of accuracy. Also the fact that you aren't stingy with photographs is a great aid in the understanding of complicated subjects. The articles "DeSoto Deuce," "Originality in Orange," "Building Headers by Hand," and "Holey Terror" were all perfect examples of what I mean.

I think CAR CRAFT is a truly fine magazine, and I hope you will continue to publish it.

Sincerely,
Jamison Carter
Chicago 13, Ill.

Thanks for the kind words, Jamie. We'll try to keep on in the same vein.—ED.

HOME USE

Dear Sirs:

I just finished reading your February '54, CAR CRAFT, and sure did enjoy it, especially the article on page 15 on the "Border City Half-Breed," that's a beautiful car. Someday I hope to do something along that line. My preference is a '36 Dodge pickup with about a '48 Dodge engine and transmission as I'm not interested in "getting there and back before everyone else."

I was also interested in your story on page 10 on "Bolt-on Equipment."

Enclosed is my dollar for six issues to be sent home for use when I get back Stateside.

Sincerely,
Bill Blackmore
c/o PM, San Francisco, Calif.

Put 'em to good use, Bill.—ED.

FENDER SKIRTS

Dear Sirs:

I'm sending my congratulations to a fine magazine which I think is wonderful.

Just purchased the March '54 issue and enjoyed it very much, especially your "Cover Car," the '49 Ford six tudor which I am writing about. I have found a slight error which is that of the skirts on the car. If you look again you will see that they are either '49 or '50 Merc skirts and not Ford.

Anyway keep up the good work and keep a fine magazine coming!

Thanks again,
Albert Memmo
Buffalo, New York

The skirts are special, to fit the Chrysler fenders.—ED.

Johnny Von Neumann's Mexico Porsche took fourth fastest, lost to his old roadster.

Hot Crosley powered Siata Spyder turned in respectable times, stuck to road like glue.

HEAD FOR THE

PIKES PEAK IN MINIATURE—

HAVING trouble finding a nice, mile-long stretch of pavement to hold drag and acceleration races on? Aren't we all!

Most areas of the country are blessed, or cursed, according to the state of mind, with lakes that are eternally wet, airports that are always busy and highways that are in constant normal use. However, there are lots of places on private or semi-private ground where there is a nice stretch of road (it need not necessarily be paved) that wanders around a few turns and then goes up a hill (Florida, parts of Texas and some of the Plains States excepted).

A good example of what can be done on such a stretch was shown by the Singer Owners Club on the semi-finished Willow Springs race course in the Mojave desert outside Los Angeles. This course, on leased land, winds for almost a mile up the side of a small desert mountain and down again for a total of about two-and-a-half miles. The section used by the SOC for their open-to-all-comers event was the first nine-tenths of a mile from the starting line to the highest point on the side of the mountain.

From the start the event was promoted primarily by word of mouth and by letters of invitation to car clubs all over the area. Came the day of the meet and more than 2000 spectators showed up together with 180 entries. Cars ranged from all-out midget race cars through full-house street roadsters and modified sports cars to family sedans. A large percentage of entrants brought their families with them for the Sunday outing, making a picnic out of the affair.

This was a time trial with a real twist. Cars were sent off the line one at a time, starting a clock at the starting line and stopping it at the finish at the peak of the hill for an elapsed time. Far trickier than a standard flat-out drag strip, the course turned sharply to the left 100 yards from the start, then took a long, sweeping right to the base of the hill, with a slight climb all the way around. Then came a steep, short climb to a sharp left and right 'S' bend to the crest and the finish line.

From start to finish the drivers were kept busy shifting up and steering for the first part of the run with a quick stab at the

Dick Hayward's '54 MG mopped up stock MG class the first time out, broadslid turns.

Practically everything on four wheels showed up for meet. 179 cars were entered.

HILLS

By Les Nehamkin

brakes, a rapid downshift and a full-bore double broadslide through the 'S' to the end of the trap. Outside of the fact that the course twists like a snake, this form of acceleration trial differs from a standard drag in one very important way; you have to shift *down* as well as up. This provides the driver with two problems, the first being one maintaining speed and the second being the problem of keeping traction, particularly on the final uphill turn. If speed drops off too much and a quick, full-bore down-shift is made, the drive wheels can break traction causing a loss of valuable time at the least and a complete end-for-end spin at the worst. The same thing can happen if the turn is taken too hot. As can be easily seen, this type of trial taxes not only the power of the engine but the reflexes of the driver and the roadability of the car. One thing is sure —it isn't a case of "stab it and steer it."

Top time of the day was set by Ernie McAfee in his Mexico Siata (CAR CRAFT, March 1954). Ernie slammed through the turns and up the hill in a bare shade over

(*Continued on next page*)

Hot Olds equipped with "asphalt slicks" lost traction on first turn and rolled.

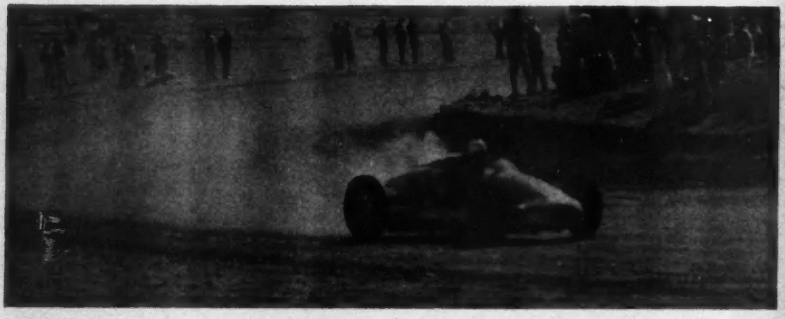
CC Editor digs off the line in a borrowed Triumph TR-2. Car felt like small Cragar.

HEAD FOR THE HILLS continued

51 seconds for the .9 mile distance. Second spot was copped by Ted Cannon's new "Thingie," a home-built coupe which ran without the body. Powered by a de-tuned Offy, Cannon's car went through in just a fraction of a second more than McAfee but still under 52 seconds.

Also sliding through in less than a minute were Tom Cobbs' neat red A-Merc roadster, a Kurtis-nosed '34 Ford coupe and a T-Merc roadster owned by Duff and Roy. Considering that most of the times turned in by the smaller sports cars and the sedans were in the one minute, two seconds to one minute, five seconds category, the times turned in by the hot dogs were outstanding. One word of warning came out of the event; asphalt-slick type racing tires won't get the job done. In most cases these tires just spun futilely on the marbled surface. In one case they caused an end-for-end flip when an Olds coupe equipped with these meaty skins came out of the first turn and lost traction just when it was most needed. The car slid sideways off the road and did a complete somersault on the graveled shoulder.

For the expenditure of only a few hundred dollars for insurance and course rental, plus a few bucks for incidentals, the sponsoring club cleaned up a neat profit of nearly $2,000—not bad for a club which has an annual take of less than $500 in dues. Even more important, however, is the fact that everybody had a ball. So far, there hasn't been one gripe or criticism—a record of some kind or other for a time trial.



30.50 cubic-inch JAP-powered Trimax race car barreled through turns as if on rails.

Second fastest time of meet was garnered by Ted Cannon's Offy-powered "thingie."

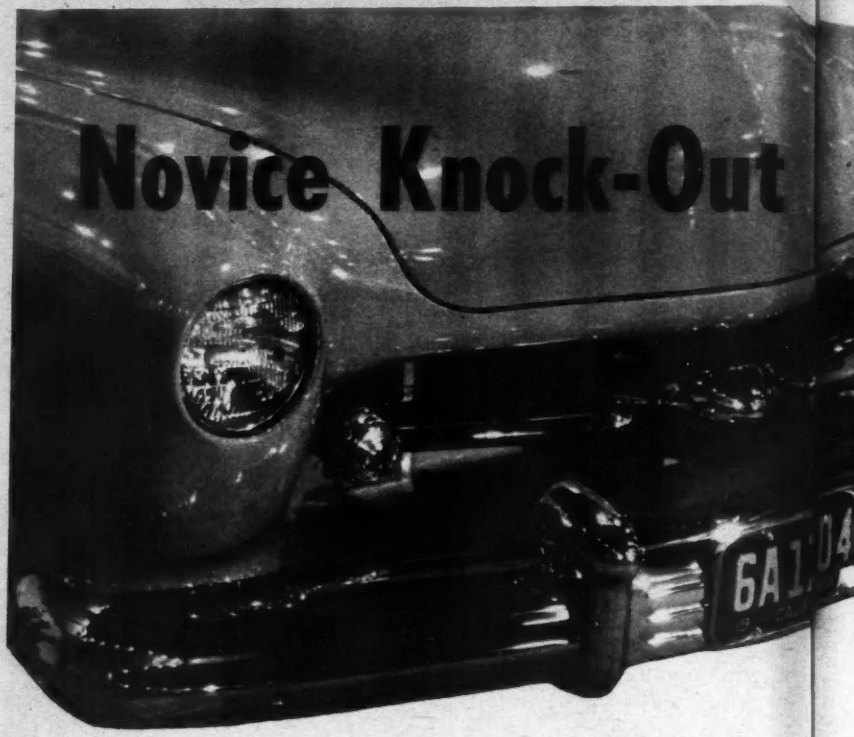
Nash Healey crosses up on final turn at the top of the hill, an easy thing to do.

Studebaker powered Glaspar roadster clawed up hill with the best of the competition.

Ernie McAfee's Siata V8, modified for Mexico, took on all comers for top time of day.

Rapid T-Merc, owned by Duff and Roy, is a familiar sight at drags and road race events.

Novice Knock-Out



From the rear, Fred DeMartini's Mercury looks just about like any other except that it makes you look twice. Duals are faired into bumpers, deck is shaved, lights are Lincoln.

Frisco showpiece proves idle customizing pays off . . .

Photos by Eric Rickman

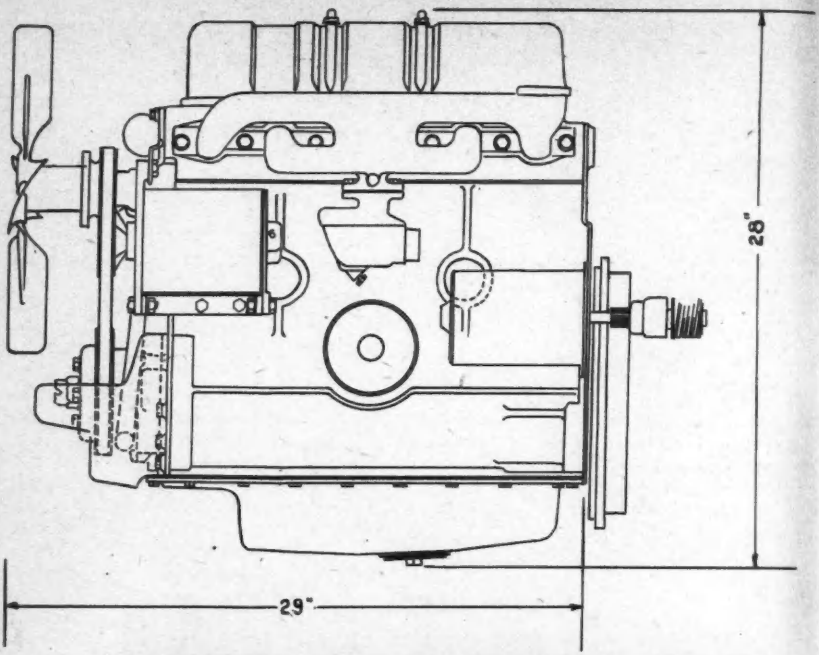
INGREDIENTS: one fire-charred '51 Merc, one roadster enthusiast with much track racing experience and absolutely no custom background. Mix well in a San Francisco back yard for about a year then dump both into one of Northern California's biggest custom shows. Result: one trophy for Best Conservative Custom.

The above is a short resume of what happened to Fred DeMartini after he acquired a very sadly totalled out Mercury Tudor. He didn't really start out with customizing in mind but when he got started rebuilding the total, things just sort of took place. For instance: grilles cost money so Fred made one up out of two '51 Frazer end pieces and a Universal headlight turned backside-to. The whole works was stuffed into the smoothed Merc opening, changing it completely. Front fenders were then extended slightly and the lights frenched in. The nose was given a shave and that was that for the front end.

The rear deck got a similar shave job and the fenders were equipped with '51 Lincoln taillights, neatly frenched. Exhaust tips, flat, à la Cadillac, were faired into the bumper ends. Aside from the usual electrically operated doors and deck, this was about it except for a custom interior done in dark and light green fabrics. The whole thing was topped off with a glistening Laurel green lacquer job.

Conservative, done in a back yard by an amateur—who says the pro's walk away with the shows?

Grille components were assembled from Frazer bars and universal-type headlight. The hood was shaved and the fenders extended forward slightly with stock lights neatly frenched in.



INDUSTRIAL

HORSES FOR THE FORD FOUR

By Chuck Eddy

Photos by Nehamkin, D'Olivo

ALTHOUGH most readers are familiar with Ford's overhead engines for passenger cars and trucks, few have seen the smallest members of the family. The two little brothers, though mere striplings in cubic inches, show unmistakable signs of hair on the chest which might interest competitors in class competition or an MG owner looking for more GO. These two engines are the 134 cubic inch "JE" and the 172 cubic inch "JD," built with identical external dimensions, but with differing sleeved bore sizes. In line with Ford's sound policy of interchangeability, many of the parts interchange with the 215 cubic inch six or other engines in the line. In addition to the low first cost, this feature provides reasonable cost on replacement parts. General design features are typical of Ford's present engine family with specific changes to adapt the engines more suitably to industrial or tractor use. It is these specific features which we will examine in the light of possible modification for competition use. Before proposed changes are discussed, it would be wise to determine what objectives in engine performance are desirable or obtainable. Some of the engines against which these *could compete* are classified here to bring out more clearly the direction which modifications should take.

Side view drawing shows height and length of the Ford Fours. Both are externally same.

Engines in the "JE" 134 cubic inch Class

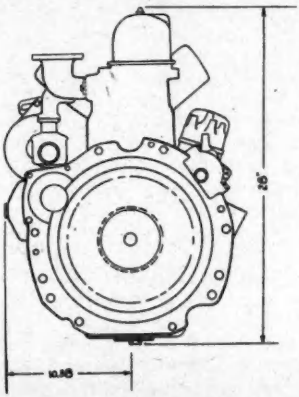
MAKE	CYLS.	DISPL.	TORQUE & RPM	H.P. & RPM	TORQUE/ CU. IN.	COMP. RATIO
Morgan Plus 4	4	127.4	Not Available	68-4200	Not Available	6.7
Sunbeam	4	138.2	124-1800	80-4200	.9	7.42
Allard Palm Beach	6	138	112-2000	68-4000	.81	6.8
Siata (2 Litre)	V-8	121.8	99-4000	105-5800	.812	8.5
Triumph TR-2	4	121.5	117-3000	90-4800	.97	8.5
"J.E." 134	4	134	110-1600	49-3200	.836	6.6
Engines in the "JD" 172 cubic inch Class						
Austin-Healey	4	162	144-2000	90-4000	.89	7.5
Aston-Martin	6	155	144-3500	125-5000	.93	8.2
Pegaso Z. 8	V-8	172	160-3600	180-6200	.93	8.8
"J.D." 172	4	172	147-1500	63-3400	.855	6.75

At first blush, both engines do not fare too well by comparison with others in their displacement classes. However, column 6, indicating torque in foot pounds per cubic inch indicates that the output of both engines in the lower rpm ranges is comparable with the *average* engine in that group. Therefore, we must concentrate on h.p. output in the higher rpm ranges, while moving maximum torque output ranges upward without too much loss.

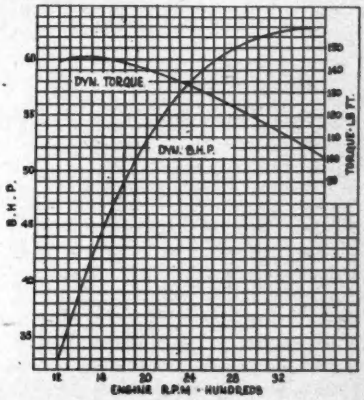
As both engines are specifically designed for durability and economical operation at *constant speed*, carburetion, manifolding, and ignition advance characteristics fulfill these requirements. Application to a sports car or trials machine requires maximum engine *flexibility*, and alteration of the above features should attain the most satisfactory *compromises* in this direction. We use "compromise" because all engines are just that and

(*Continued on next page*)

DYNAMITE

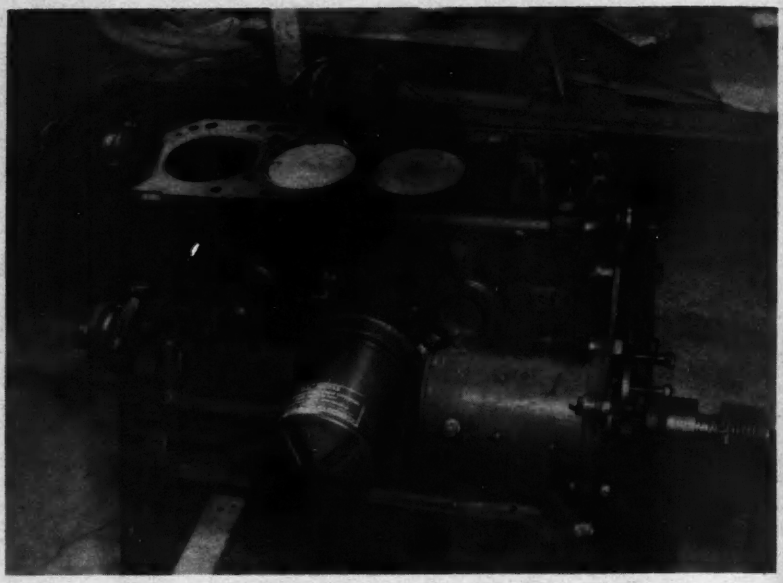


Rear view of the new engines shows easily adapted bell-housing bolt circle and width.



Stock power, torque curves of 172 show potential. Dropoff is caused by restrictions.

INDUSTRIAL DYNAMITE continued



Left side view of 172 cu. in. block illustrates extreme stiffness of the new four-barrels.

(*Continued from preceding page*)

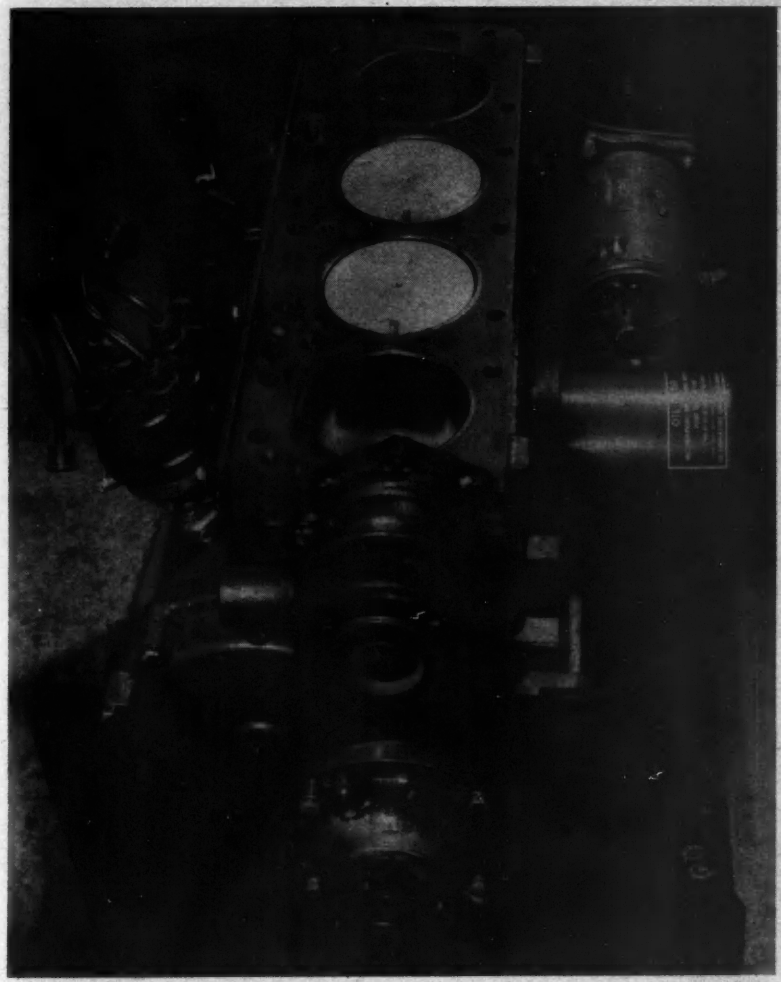
extreme characteristics, such as high h.p. at high rpm, are not obtained without sacrifice of some other desirable engine attributes. Accordingly, we will recommend changes which may seem conservative to some of you, accustomed to wild outputs from "nitro-drunk churns." As many associations' competition rules out the use of fuels other than gasoline, we must keep this limitation in mind.

STOCK FEATURES AND MODIFICATIONS

Pistons -

These are steel-strutted aluminum alloy pistons employing .912 inch pins to fit the 6 cylinder connecting rods. Slight cylinder bore honing for .002 inch additional clearance might be desirable if the engine is to be operated at maximum output for sustained periods *without* a 3000-5000 mile break-in. The sleeves on either engine may be removed and larger pistons fitted for additional displacement. At the time of writing, we could not verify what wall thickness the sleeves employed. Consequently, the 3.56 inch bore on the Mark II JE and the 4.025 inch bore of the Mark II JD, *assume* normal 1/10th sleeve walls. An additional oversize of the 134 JE could be obtained with the use of '54, 6 cyl. EBP-6108 pistons of 3.62 inch diameter. Piston pin to piston head distance should be checked before this substitution is attempted! As a modified version of the 134 has already been operated in excess of 6000 rpm, we feel the stock lower end and pistons will be satisfactory. When initially fitting pistons, pay close attention to proper specifications for ring side and gap clearance and *avoid tight pin fits.* Specifications of .001 inch to .0015 piston fits in the cylinder bores will be very good for either engine, except for extreme operating conditions.

(*Continued on page 20*)



View from front of 172 block illustrates huge piston area giving engine its hefty torque.

Lightening procedure has been applied to valves. (L to R) Lincoln, Ford Six, stock exhaust.

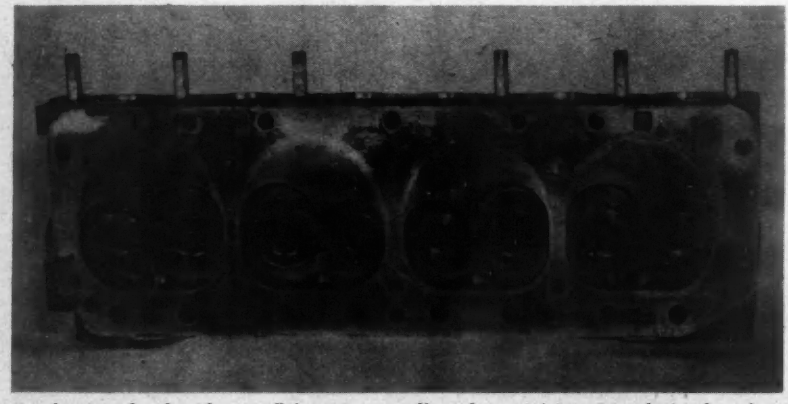
(*Continued from page 18*)

Head and Valves

Undue concern could be expressed about the fact that the head employs siamesed intake ports. We might point out that the identical situation prevailed in the '52-'53 six cylinder heads, on the four center cylinders. Naturally, all possible enlargement of the ports should be taken advantage of, particularly if a larger I.D. fabricated intake manifold is to be used.

In the stock version, both engines use the EAA, '52, six cylinder intake valves. No great improvement in breathing capacity can be attained by merely substituting larger "poppers." The whole induction system must be cleaned out, together with a vastly im-

(*Continued on page 61*)



Combustion chambers have sufficient room to allow the use of 2-in. Lincoln intake valves.

STOCK AND MODIFIED SPECIFICATIONS FOR THE "134" AND "172" ENGINES

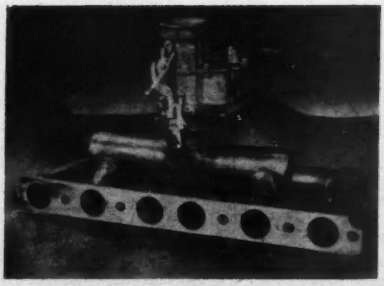
	PISTONS	HEAD	VALVES	MANI-FOLDS	CARBU-RETION	IGNI-TION	CAM-SHAFT
JE-134, STOCK 134 CU. IN. 2200 C.C.	EAE 6108 3.44" bore	C. Ratio 6.6-1 Chamber volume 5.98 cu. in. 98 c.c.	Intake EAA 6507 1.65" diameter. Exhaust EAF 6505D about 1.5" diameter.	Single-throat updraft EAE-9425C.	EAE-9510C about ⅞" venturi (restricted).	FAC-12127D centrifugal advance only.	EAF-6250F short duration about .330 lift at valves.
JE MARK I 134 CU. IN. 2200 C.C.	EAE 6108 3.44" bore	C. Ratio 8.5-1 Chamber volume 4.47 cu. in. 73.4 c.c. Mill off ¼ of avg. chamber depth.	Intake—Use EBP-6507, '54 6-cyl. valves Exhaust—Stock. Lighten and polish.	A. Invert stock manifold, enlarge passages. B. Dual 1⅜" fabricated tube.	A. Use 52-53 6-cyl., EAA-9510 carb 1¼" vent. B. Above or 1⅛" side drafts.	A. Convert 6-cyl. ignition to 4-cyl. Loadamatic. B. Load-controlled centrifugal advance type.	Regrind for additional duration. Use with high lift 1.5 ratio rockers.
JE MARK II 143.5 CU. IN. 2350 C.C.	Remove sleeves. 3.56" bore.	C. Ratio 8.5-1 Chamber volume 4.78 cu. in. 78.4 c.c. Mill off 1/5 of avg. chamber depth.	Same as Mark I, above.	B, as above. Possible use of 1½" tube indicated.	A or B, as above. Use of 1¼" venturi indicated.	B. Load-controlled, centrifugally advanced. Total advance, about 35°.	Billet shaft 276° duration .414" lift with 1.5 ratio rockers.
JD-172 STOCK 172 CU. IN. 2820 C.C.	EAF 6108 3.9" bore Under 3 litre class.	C. Ratio 6.75-1 Chamber volume 7.48 cu. in. 122.5 c.c.	Intake 1.65" Exhaust 1.5" Same as 134" above.	Single-throat updraft EAF-9425E larger than 134".	EAF-9510D about 1" venturi (restricted).	FAC-12127D same as 134" above.	EAF-6250F same as JE, above.
JD MARK I 172 CU. IN. 2820 C.C.	EAF 6108 3.9" bore	C. Ratio 8-1 Chamber volume reduced to 6.15" 101 c.c. Mill off ¼ of avg. chamber depth.	Intake 2.00" EAD-6507J Lightened and polished as in photo.	A. Invert EAF manifold above. B. Dual, made of 1⅜" tube.	A. Use EBP-9510 1⅜" venturi. B. Dual, using above carb.	Same as Mark I JE above.	Same as Mark I above.
JD MARK II	Remove sleeves. 4.025" bore. 4" bore produces 181 cubic inches. (Upper limit Class 'D')	C. Ratio 8-1 Reduce chamber volume to 6.5" 106.5 c.c. Mill off 1/6 avg. chamber depth.	Same as Mark I JD, above.	Same as Mark I JD, above.	Same as B above.	Same as Mark II JE above.	Same as Mark II JE, above.

HERE'S HOW:

BIG LUNGS, SMALL ENGINE

OPENING UP THE FORD FOUR

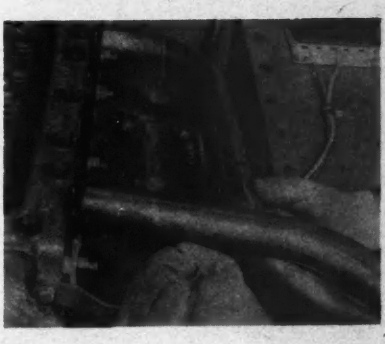
AS HAS been pointed out, one of the most-important steps to power in the Ford Four is an increase in its breathing capacity. Here, step-by-step, is the first of a two-part series explaining how this may be done in your own garage. The first part shows the header or exhaust lead construction on the one-unit intake-exhaust manifold. Next month, in a similar feature, we will show the intake manifold construction and the finishing touches. The complete unit is shown in the title photo.



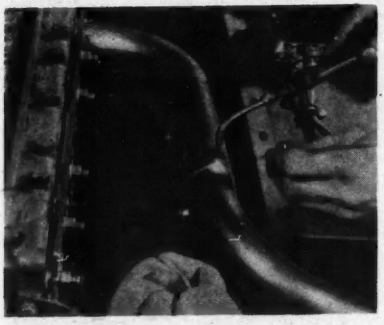
First step in the construction is the fabrication of a steel flange from quarter by two-inch flat stock. For best results, the ports, both intake and exhaust, should have been reamed out to 1 5/8 inches. Manifold ports should match these in size and contour. The pattern for this can be taken from the head itself.

Photo Story by Les Nehamkin

After the header flange has been made it is bushed out from the block by using 3 spacer washers on each stud between it and the block. This allows for visual inspection of the fit of each lead. Here the main lead has been fitted through the flange for inspection.



A piece of the 1⅝-inch tubing is set in place in the flange to the number 4 exhaust port to determine the proper length and contour of its fit in the main lead line.

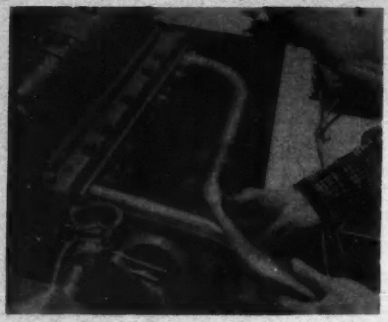


A 1⅞-inch adapter tube is being welded on to the 1⅝-inch main lead. This 1⅝-inch tube will later be fitted to a length of larger tubing used as a main head pipe

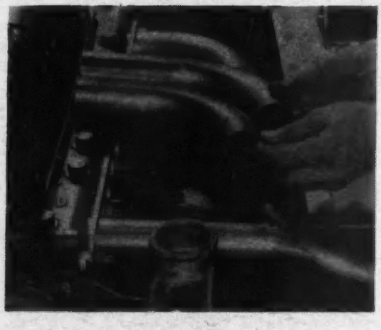
Next the number 4 lead is cut and trimmed to the proper length and shape. Its toe, or leading edge, is hand-formed and shaped over a mandril to exactly fit the opening in the main lead line.

CONTINUED

HERE'S HOW continued



The number 4 lead is checked again for fit and location on the main lead before it is welded into the main line.



Both number 2 and number 3 leads are being checked for length and relative positioning on the main lead line before they are cut to length and contour. Constant checking and re-checking will save much time, labor and material if it is done before cutting and welding.

After the number 2 and number 3 leads have been cut and shaped to main lead's contour, outline marks are made around each lead's final position on the main line to serve as a pattern for the openings to be made in the main lead.

Cuts in the main line are made on a band saw. Make sure the cuts are well within the outline marks of the lead openings.

Lead openings previously made on a band saw are brought to exact outline size by using aircraft type metal trim shears.

The number 2 lead is spotted to the main line with the lead inserted in its proper position in the flange. Mild steel welding rod and an oxy-acetylene torch with a medium tip is used for this operation.

Completion of welding of leads is accomplished on a bench. Note the "C" clamp jig set-up used to hold the leads in proper position and alignment through the header flange.

After being flared to a proper fit over a mandril, a short length of 2-inch tubing is used to serve as a connection between the adapter tube previously welded to the main line and the exhaust line.

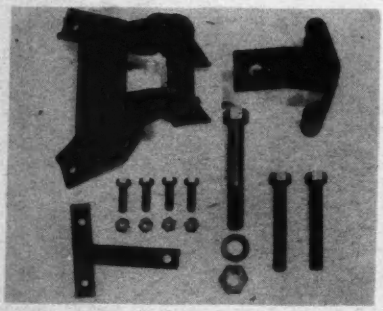
LOWERING THE EASY WAY

ALMOST everybody has heard of lowering blocks with which one can in a couple of hours, lower the rear end of any late-model car, provided, of course, that it is equipped with longitudinal semi-elliptic springs.

In most instances, at least judging from our correspondence, folks are pretty much in the dark when it comes to what can be done to drop the front end of a car. To see what could be found out we trudged about the city to various shops and came up with three methods which seemed to do the best job of lowering with the least amount of problems. Any form of change to a factory designed component, let it be understood, has certain faults, that is, unless the entire unit is repositioned so that *all* working parts bear the same relationship to each other and *all* stress factors are the same as before.

There are two schools of thought on lowering. One says, "let's reduce tension on the spring." The other says: "let's raise the spindle and thereby the hub and wheel." The fault with number one is that it allows less spring travel and gives a slower spring rate. The fault of the second is that it lowers the roll center, reducing the amount of bite the tire gets on corners. Neither of these presents any problem except under competition stress, though. There's another method, too—heating the spring to reduce its length. To this method all we can say is: DON'T DO IT!

First on the list is that of the Valley Custom Shop of Burbank, California. This one follows the second school of thought, that of raising the spindle. The second method is that of Joseph Conrad & Associates, following school number one. The third method also follows school number one and requires no kit, merely a torch and a special rubber spring bushing. Let it be understood now, though, that the most satisfaction will be gained by making sure that all shocks and stabilizers are in top shape, even if it means going to station wagon equipment. In any case—here we go.



The installation shown on these pages was the early type of hand fabricated kit made by Valley Custom. For those who are not welders Valley has a bolt-on kit made up of ready-made parts which you can put together yourself as shown in this photograph.

First, remove both upper and lower arms, disconnecting lower arm from the spindle.

Set in the lower A arm block as provided in the kit and weld as shown in this photo.

After removing the upper control arm from the frame, place the upper block in the regular upper control arm bracket and locate.

Remove the bolts and place the upper arm on the block and fasten it down securely with the bolts supplied in the lowering kit.

Remount the lower A arm to the frame in its normal position, install the spring and shock absorber and then bolt the upper end of the new spindle mounting to the spindle.

When complete, the job should look similar to this one. Note that all components bear same relationship to each other as before. A station wagon stabilizer is recommended.

LOWERING THE EASY WAY continued

BEFORE

AFTER

Here is a different type of lowering kit which operates on the principle of reduced spring pressure. Rather than cutting the spring, the spring base is lowered slightly, giving a total drop of 2½ to 3 inches. Basically the kit is made up of four metal blocks with specially hardened mounting bolts and elongated stabilizer clips. It's simple in method as you can see here.

Job by Jack D'Andrea
Kit by Conrad & Associates

Here it is—stock and dirty, a '51 Ford front end. First step is to raise the car up with jack on center of front cross member, allowing wheels to drop free. Block the wheels and then drop car onto blocks.

Next, remove the stabilizer bar by loosening clamps on lower A arms. In this case the bar was replaced with a Ranch Wagon bar which afforded considerable stiffness and stopped bottoming tendencies on turns.

Either chisel or burn off the rivets holding the spring plate to the 'A' arm. Be sure that the jack is in the position shown to prevent the plate from releasing the coil and allowing you to jack plate back up.

After rivet heads are cut off, use a drift punch to knock the rivets loose from plate and arm. It's best to work one side at a time, rather than cutting everything adrift at once, if only to prevent bruised hands.

After spring plate has dropped free on one side, drive lowering block between plate and arm. We say drive because in this case the job was done one side at a time, making it easier to line up and locate bolts.

When the block has been driven into place, locate it properly by poking a screw driver through the rivet holes in plate and A arm and through the block as shown in this picture. This saves fingers as well as temper.

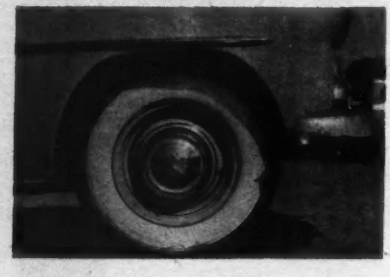
With the block properly aligned, either raise the jack or drop the car slightly with a block under the spring plate at the rear corner as shown here. This forces the plate firmly up against the block and arm.

After the plate has been fastened with the bolts provided in the kit to the A arm on both sides, remove about ¾ of an inch of the rubber bumper pad to prevent too rapid bottoming. Effect of block lowers spring.

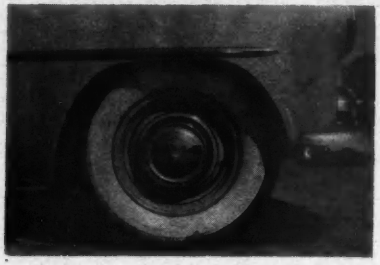
Here's the finished job, still dirty, still a '51 Ford, but two and a half inches lower to the ground. Compare hefty stabilizer with the stock item in picture number two. Effect of the heavier bar is astounding.

LOWERING THE EASY WAY continued

BEFORE



AFTER



First jack car up and place a stationary jack under the cross member to support the car off the ground while working. Next remove the shock and the stabilizer support. Place a portable jack under the A arm as shown, then unbolt lower inner A arm bolts.

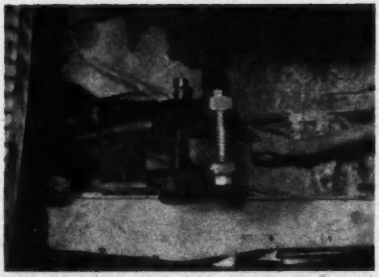
After A arm is completely disconnected, slowly release jack 'til the spring tension is off the A arm. Now you can remove spring.

The preceding two methods of lowering were applied to Fords but would work equally well with a Chevrolet. Here, however, is the Chev in person. The job here is that done by George Cerny's shop in Compton, California. One and a half rings were cut from each of two stock springs and a hard rubber bushing placed between the coils for stabilizing purposes. This job drops the car 2½ to 3 inches which is plenty; any more would result in bottoming. This is a case where "easy does it."

Before installing the spring, cut half of the rubber snubber attached to A arm.

When cutting the coils, remove them from the bottom of the spring. Remove only 1½ coils from either a stock or power-glide coil spring. Let hot end of spring cool naturally; DO NOT COOL WITH WATER.

A special spring spreader tool (left) will have to be used to install the small rubber booster (right). The boosters, if not available at your local accessory store, can be purchased at D. & D. Engineering Co.



Place the spring back in its original position and compress the A arm back up. At this point install the rubber booster in the center of the coil spring as shown here.

Re-bolt the A arm and the stabilizer support, and re-install the shock. Remove the jack and the job is complete. The time taken to lower car was approximately 3½ hours.

FROM NEEDLE

GAYLORD SWAPS THREAD

TROUBLE with customizing an expensive late model car is that by the time the torch artist is through, the initial cost of the buggy has gone up by about 50 percent. This, coupled with the huge depreciation in resale value of any late model car, puts the owner in the position of having laid out two to three thousand dollars for the privilege of driving a dream. It all boils down to transportation at the rate of 10 bucks a day, not including gas, oil, tires and maintenance costs. This is mighty expensive traveling in anybody's language.

Bill Gaylord is no millionaire. The lad makes those beautiful custom interiors that we've been featuring from time to time. However, Bill needed something to show off his wares . . . and what more natural than a show custom? Bill pondered the problem a bit, then ran out to see what he could find. He came up with a burnt-out '53 Olds Holiday coupe that some kind insurance company had given up as a total loss. Bill carried the car home in bushel baskets and set about stuffing it together in the way he thought an Olds should have been stuffed in the first place.

Gaylord is a top man as well as an upholsterer, so the first thing that got the axe was the metal top. Bill sat down and designed a completely new padded top for the car, a real futuristic piece of equipment about which we will have much more to say next month.

Starting from the front, Bill completely reworked the Olds as follows:

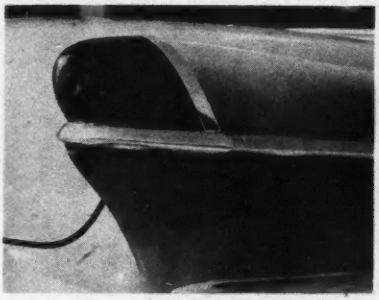
Front fender was extended, '53 Buick lights inset in peaks and the whole unit frenched.

Yacht-like appearance of Gaylord's '53 Olds Holiday is due to swept back lines and contrasting orange and off-white paint job.

TO TORCH

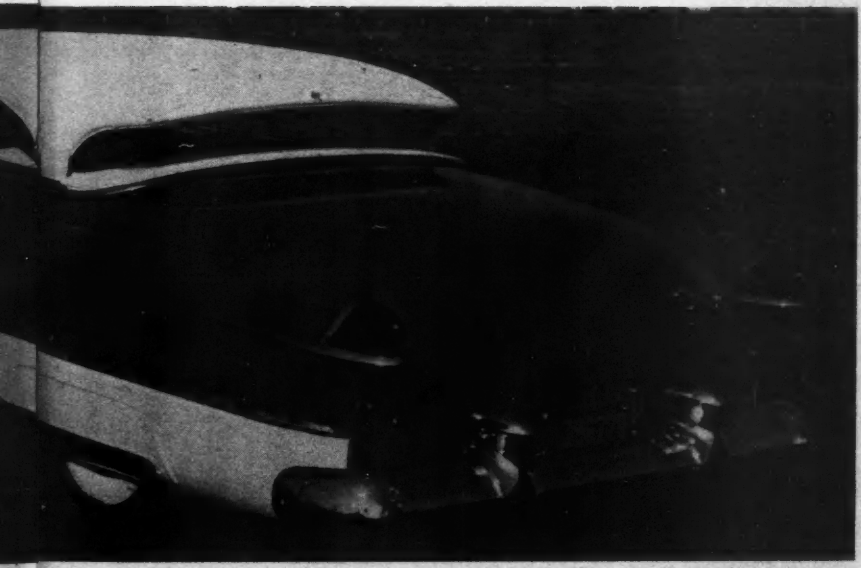
FOR LEAD

Photos by Tom Medley

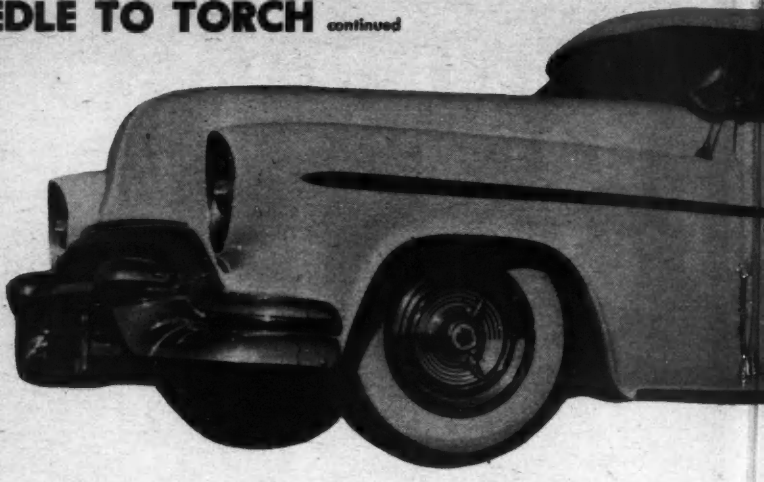


Rear fenders were extended and peaked at the top and '54 Packard taillights adapted.

Upper rear fender trim is stock but lower skirt trim was cut from 18 gauge sheet stock.



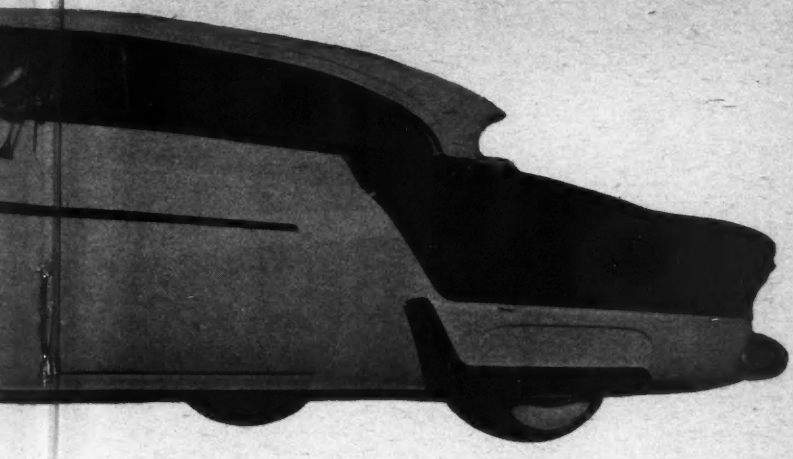
NEEDLE TO TORCH continued



The grille was remade from stock Olds components. First the oval end trim was reversed to form two round "dagmar" ornaments, then these were faired into the center bar which had been completely smoothed.

Front fenders were extended two inches at the top and equipped with Buick headlight rims. The hood was peaked, the peak being contoured all the way off the nose to the upper lip-bar on the grille. Along the side, the trim has been left pretty much the way the GM designers planned it, with one

Rear deck of the Oldsmobile was given a shave job. Exhausts were led through bumper tips.

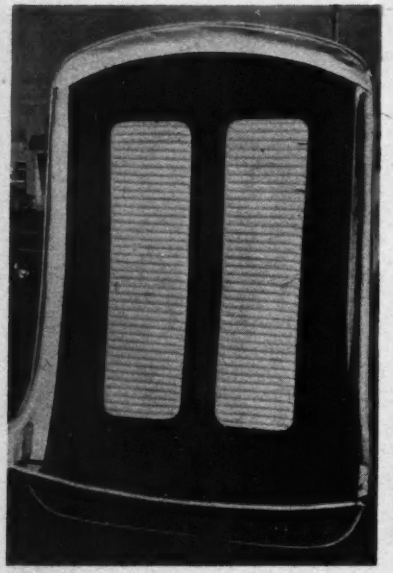


or two notable exceptions. Standard operating procedure, of course, dictated the use of electric door latches, hence no handles. The second exception is the rear fender skirt trim. This little goodie was cut and hammered from a piece of stainless steel and then buffed to chrome-like brilliance.

The back of each rear fender was extended, peaked and then equipped with a '54 Packard taillight, completely changing the rear aspect of the car. Through the rear bumper went a pair of round exhaust tips.

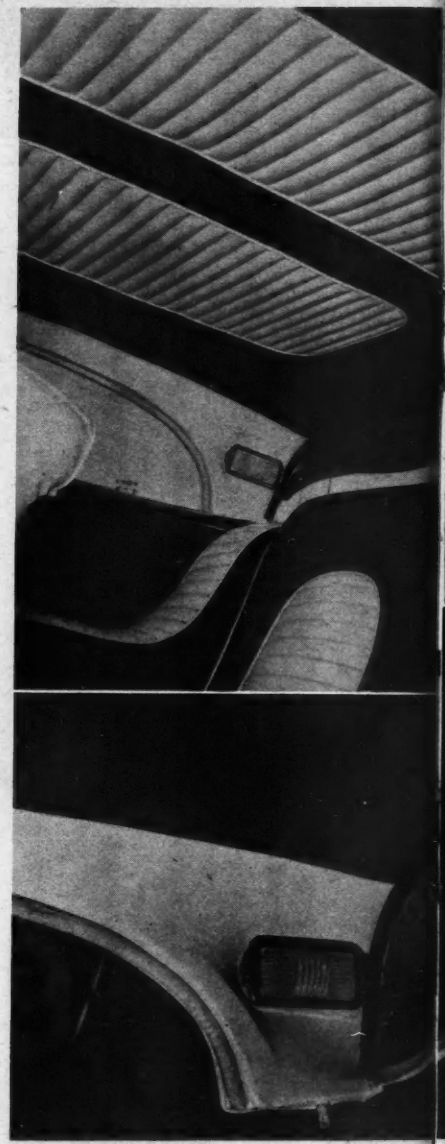
Grille ornaments were reversed, faired into center bar. Hood was peaked full length.

NEEDLE TO TORCH continued

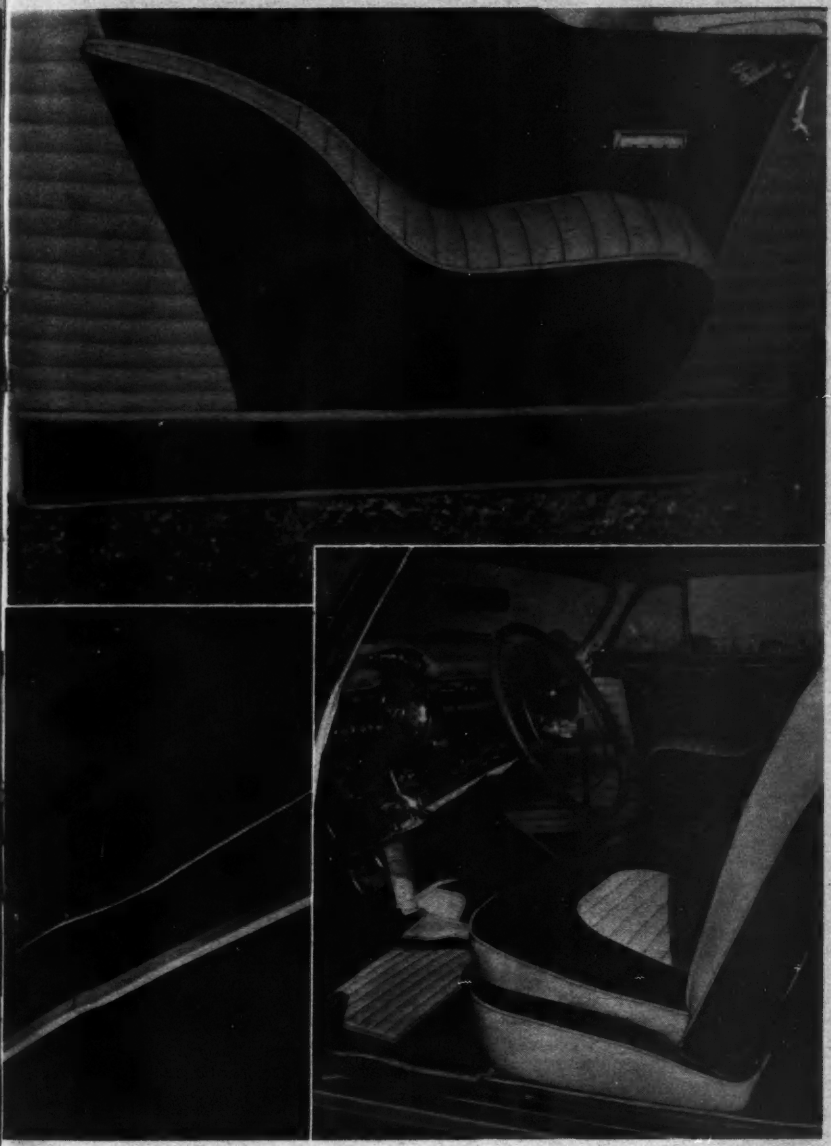


New top was designed and executed by Gaylord. Big feature is shielded rear window.

However, it was the interior, naturally, which got the works. Completely upholstered from floor to top, the whole inside was padded with foam rubber and covered with contrasting red and white Naugahyde in the best Gaylord tradition. Without doubt, this is the most upholstered car in show business. In this case it's all to the good since the main idea is to show off the Gaylord stock-in-trade. After all, a man needs a showcase to show off his wares.



These views of the interior graphically illustrate what is meant when we say that



Gaylord built his custom as a show-case for his stock-in-trade. Every nook and cranny in the sumptuous interior has been given the full foam-padding and roll-and-pleat treatment.

Stage a trials meet and Have a Bash!

By Bill Onslow with the Editors of *Car Craft* Magazine
Drawings by Dick Day

SUCCESS, defined by Webster, is "a favorable termination of a venture." To a club planning the promotion of an automotive sporting event such as a trials meet this "favorable termination" can be achieved only by paying close attention to two very important phases of promotion, whether the contemplated event is a drag race, road race, reliability run or the subject trials event.

The first of these is the consideration of what the entire meet will require from the standpoint of manpower. The second is the amount of attention paid to those minor details which can become major headaches if not caught in the "minor" stage during early planning.

The main reason we emphasize this point is that undoubtedly all of us have attended or participated in some kind of group event that was not handled well. The letdown experienced left us with somewhat less than eager anticipation for the next event handled by the same club or group. For any type of sport to take hold it must be handled well from the beginning.

The first consideration, that of manpower, can be closely figured from the tentative working groups or committees listed below. If your club happens to be one with a small membership, say ten or fifteen members, don't despair. You can always solicit aid from another local or nearby club for assistance on a 50/50 basis. Members can also double up on jobs, no one job being a full-time proposition. Motorcycle clubs, first to import trials to America, are usually well experienced and can prove to be of great help; in most cases all you have to do is ask. As far as secretarial help goes, you can always form a women's auxiliary, which is a polite way of saying that you've been able to draft club wives, sisters and girl friends into writing and typing applications and press releases. Sometimes they'll even form a club of their own. If that happens they'll take the meet away from you—bless 'em.

To start any kind of a meet you have to have some place to start. We won't attempt at this time to set any hard and fast rules but here are some points to cover. Listed

are the various committees, tentative course layouts, course regulations, a scoring table and finally that point of contention where we really stick out our necks, car regulations.

COMMITTEES

Chairman of Committees

A committee chairman will be needed to preside over the preparations of the entire meet. He will work close to other committee chairmen and actually serve as a production manager for the club. If the membership happens to be small, as mentioned before, this position could be filled by the president of the club.

Course Committee

This group will be one of the largest of the committees and should number from eight to ten persons. A chairman should be appointed and have at his disposal two immediate assistants. These three will actually lay the ground work for the trials such as finding the land or area that will be used for the event, procuring its use in a legal manner and then roughly laying out a course schedule. While these three are busy obtaining the property, the remainder of the committee can be collecting the various materials that will be needed for laying out the observed sections, such as markers, flags, stakes, stop watches, clip boards for the individual checkers, etc. When the property for the event has been procured and the course and sections tentatively determined, the entire committee should turn-to and lay-out the complete course in detail (see course layout).

Entry Blank and Advertising Committee

This group should consist of approximately three to four members, and their job will be to make up the entry blanks, handle advertisement for the event and any miscellaneous literature that will be needed. The entry blanks present no problem for they are basic items that accompany any event, but if trouble is experienced on make up, another club's blank can be helpful from the standpoint of outline or procedure. It will also be necessary to make up number plates and literature stating the rules governing the event and the point system that is to be used. Information sheet and number plates should be given to the entrant when he signs up the morning of the event. The number plates are easily made up from cardboard pie-plates with numbers painted on with black shoe dye. Attach the plates to the left front side of the car with small flexible wire. From past experiences, the entry system seems to work much smoother if entries are handled on a post entry basis with a conservative time limit being placed on entrants to sign up. Entry blanks and regulation literature should, if at all possible, be of a mimeograph process. It makes a much more presentable package and legibility is good.

The advertising program should receive a large amount of thought, not leaving one possible stone unturned for a chance at publicity for the event. The best method of

. . . not leaving one possible stone unturned for a chance at publicity for the event.

course, if the club's treasury allows, is to have small printed posters made up. Many independent printing houses have a cut rate price on items of this type, and this should definitely be looked into. If by chance this proves impossible, the second choice would be to make up mimeographed sheets or free-hand printed posters to suffice. These posters should be distributed well in advance of the day of the event, and in every conceivable spot where automotive interest thrives and in areas where interest for the event could be created. Speed shops, garages, local businesses where automotive enthusiasts converge, such as drive-ins and restaurants, prove very good areas for poster and publicity. Informing large sports car and hot rod associations of the event is a good move. Local news-

(Continued on next page)

papers will usually lend support and cooperation for publicity. In some cases if acknowledgement is made enough in advance before deadlines, national monthly magazines can offer some assistance from an editorial position. Try everything that comes to mind; the success of the event can be made at this point, or fall a dud due to a lack of good publicity.

Concession Committee

If concessions are to be sold at the event, then a committee of three or four people should be installed to make the initial arrangements, with a larger group to assist with sales during the event. There are two methods that can be used, one, if the club is large enough in membership to handle the setting-up and sales, this will prove most lucrative for the club's treasury. But, if the club membership is limited to a small number, it will be best to contact a commercial concession company to handle the job for the event. There are many of these companies, and all have portable facilities that can be employed. These companies usually work on a percentage basis with the clubs. It should be expressed that concessions at any type of a meet, in most cases, gain more dollars for the treasury's till than either admissions or entry fees. (In the near future CAR CRAFT will feature a story on building a portable concession stand and ice tanks.)

Entry Committee

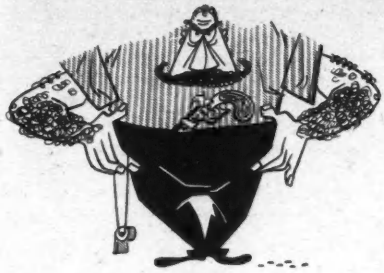
This committee will consist of three groups: one of two persons to handle signing-up and issuing number plates to all entrants, a second group of two persons to inspect all entered vehicles for rules and regulations, and a third group to sell admission tickets at the gate and regulate parking of spectators' cars. The latter group will consist of enough members to handle the anticipated crowd.

Checkers Committee

The size of this group will be determined by the number of observed sections that are to be included in the course. Each observed section should have three checkers. Allotting this many checkers to a section might seem out of proportion for what has been the standard procedure in the past of only two checkers. But, by assigning each section three checkers, one man can act as a relief checker and also there is at the section's disposal a free man to run any errand that might be needed. This method completely eliminates setting up any type of relief system for the checkers or any handy-man unit that is sometimes called upon to repair or replace any course markers. The section is reliant upon itself throughout the event. The three section checkers are responsible for keeping their individual section in order. This means that before allowing a participant to begin his tour through the section, that all damaged or leaning course markers be replaced and the section is in order. The checker positioned at the entrance of the section will have to be equipped with a stop watch so as to time the participant for his elapsed time spent in the section. It will be necessary to situate the beginning of the observed section and the finish in a position so that the timing checker can observe both for starting and stopping the timing watch (see Course Lay-out). One of the most important items for the checkers is that all the persons occupying these positions know the method of scoring. It is a very good idea to set up a sort of training program after the checkers have been designated. The training program should consist of several meetings acquainting the checkers with the checking method that is going to be employed, and the point system. When they have become familiar with this phase, set up a dummy trials section and let each one score a car negotiating the section with the chairman of the group or instructor looking on. These small practice classes will teach the checkers to judge and score alike, and by the time the event is due to come off, he or she will be well experienced. At no time should a checker discuss scoring or infractions of rules with a participant. If a dispute occurs, the participant should be directed to the referee.

Referee

A referee should be appointed to supervise the event. It works very well to fill this position with the chairman of the course



An event referee should be appointed . . .

committee, for he is more familiar with the course and its layout than any other member. His position is only required during the actual running of the event and his job will be to handle all protests and hassles that come up.

Tow-Truck Crew

Some means of towing stalled or bogged down vehicles from sections should be devised. A tow-truck or a jeep will do the job, manned with a couple of people to work the rig. Their position at the event, when not being used, should be in a central location of the course so they can be summoned from any observed section without too much trouble.

Clean-up Crew

Clean up the area after the event is over.

When the event is over, the area will necessitate policing-up. With the cooperation of all hands, clean the area and return it to its original condition. This is a guarantee for the club from the owner's standpoint. Your efforts will not go unnoticed and when it comes time for your club to stage another event in this area, the property owner will be more cooperative because of your conduct and thoughtfulness.

PROCURING PROPERTY

When this country first brought English-type trials to its sporting scene, it was through the medium of motorcycles. The bike enthusiasts, like all Americans, discarded the traditionary English method of staging the event so that it ran from point to point, covering much mileage with the observed sections incorporated in the charted course. Instead, they used the general idea behind the event; checkers, point system for penalties, etc., but when it came to a course, they centralized it in one area for several very good reasons.

Keeping the event and its participants off the busy highways on a Sunday spared the traffic problem, and also eliminated the chance of some hotshoe participant shedding a bad light on the event and the club through some public barreling. Staging the meet in one location lets the club work together in unison, and does not necessitate spreading checkers and club personnel over hill and dale with permission of several property owners involved. The event also offered some very humorous spectating for the non-competing enthusiasts and general public, and what could be better than to have the meet set up so that they could witness all with only a small amount of pedestrian movement from section to section, or mudhole to mudhole.

When the MG Car Club of America staged their first trials, which was covered in our last month's issue (May '54) of CAR CRAFT, they also staged the event in one location. The meet was a huge success and it was proved that not only could small equipment, like motorcycles be accommodated in a closed area, but automotive equipment too.

With these proven and successful facts, we feel, as you will, that trials are a natural

(*Continued on next page*)

Have a Bash! continued

for a closed course and should be promoted so. We hope that these suggestions of procuring property, selecting observed sections, laying out the course, will be of some assistance.

When the course committee chairman and his two assistants set out to seek an area to stage the event, three items should be considered: keep the traveling distance to a minimum for participants and spectators if possible, select an area that will offer a variety of terrain and one with some kind of parking facility. We can't tell you where to find property, for you know your locality better than we do, but we can suggest types of terrain to look for.

If your countryside is blessed with foothills, then this is a natural setup. All that is needed is to select an area that has a large basin or valley with the hills surrounding it not possessing too steep of grades or climbs. In this type terrain you have at your disposal up and downhill grades, ridges that can be utilized for wrong-cambered turns and descents. The basin can offer some twisting and sharp sections. If your area does consist of hilly country such as this, then your problem of terrain is simplified.

If your locality is one of a flat nature.

Perhaps your locality is one of a flat nature with the countryside being mostly made up of pasture land. If this be the case, several items of nature can be developed into making a very satisfactory course. The side of a riverbed will come up with some promising hazards, with natural water crossings here and there; a countryside creek bed, if it's adjoined by a wooded section of property. Wooded areas work out perfectly for observed sections from the standpoint of tough maneuverability and limited visibility for surprising course elements. No matter how you look at it trials areas can originate from many varied types of terrain and still constitute a successful course.

Present yourself in a respectable manner.

When the property for the meet has been selected and it comes time for you to ask for permission to use it, present yourself in a respectable manner and thoroughly explain your club's desires. In many cases where the owner of the property is not familiar with this type of event or your club's activity in the past, it's a good idea to compile a few gimmicks or persuaders such as a commercial salesman might do before confronting a prospective buyer. The persuaders in this case would be any of the club's affiliations with local law enforcement agencies, national automotive safety associations, past successful records of previous events, and

any items that will prove your club as a well organized group with respectable intentions. In cases where the owners are a little reluctant because of the personal liability involved, the club can procure insurance at a minimum of cost that will cover the event, relieving the owner of the burden of responsibility. This type of insurance is usually based on estimated spectator attendance and is well worth the minimum cost for the club as well as the property owner. If these simple and general channels are followed when procuring the property, we feel that the man will have a hard time saying "No"!

Laying Out the Course

To begin with, the course committee by now will be fairly familiar with the area selected for the event and its possibilities. The first decision will have to be the number of observed sections in the course. The motorcycle trials usually consisted of ten sections, with each participant completing three to four laps. This was accomplished only from the fact that bikes are much smaller equipment and can be run through one section at a time much faster than cars with hassles of being bogged down limited. With cars that frequently require removal from sections with the tow-truck, the event moves considerably slower, the laps per participant usually has to be restricted to only one. This applies to a course that has from five to ten observed sections.

In many cases the area of land will determine the number of sections that can be incorporated; a small area will only allow five to six and a large area an unlimited amount. But no matter how much room is available, it would be wise for the first event to include only five good sections with the assurance of gaining initial experience and staging a well organized event rather than burdening the club with too much work.

A successful lay-out plan should consist of the number one observed section of the starting point to be positioned so that all other sections follow in a progressive manner. The last section's finishing point should be fairly close to the starting area's location forming sort of half or full circle (see diagram A). This manner of lay-out assists the entrant in locating the following section when just completing one. The only important rule to follow is make sure that you leave enough distance between the end of one section and the start of another for a waiting area so that this area doesn't become overly crowded with cars.

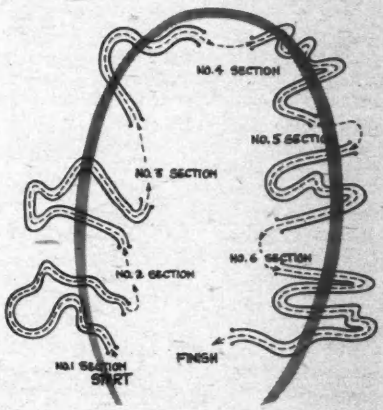
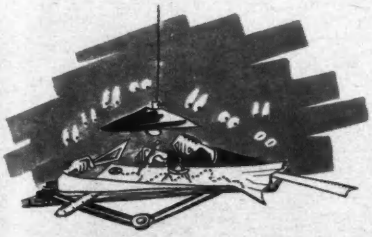


Diagram A

This type of progressive section layout has proved the easiest method yet for sponsoring club and the participants. Note that the course forms a half circle, and the sections follow one another to the finish.



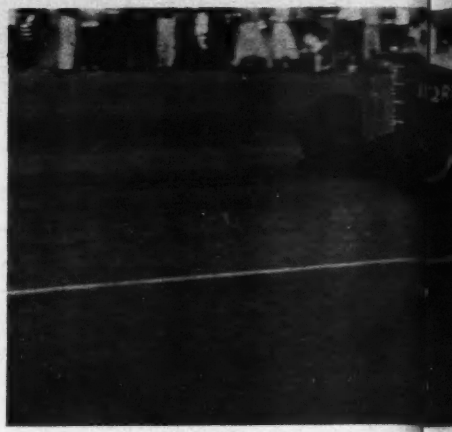
First, the number of observed sections . . .

Selecting Sections

When selecting sections you should try to keep them varied to the fullest measure, with

(*Continued on page 58*)

BONNEVILLE BOUND



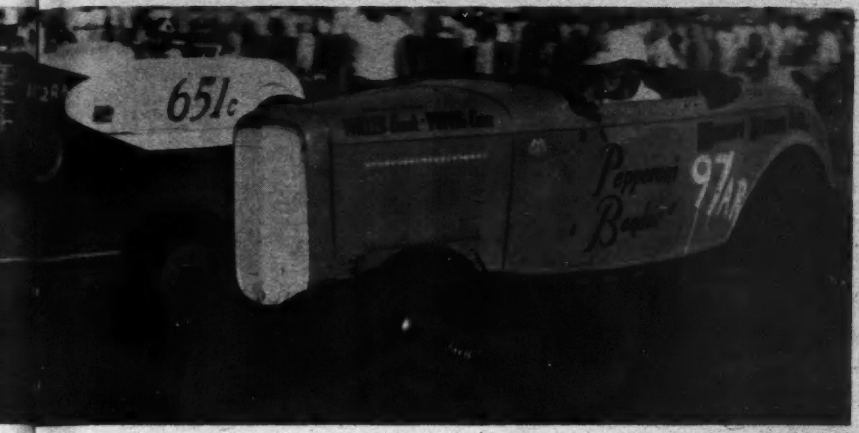
YOU might say that Roger Hardcastle of Los Altos, California, started out young—age 12 to be exact. At that tender age, when most youngsters are still happily making with the soap boxes, Roger was stuffing together a small wooden-bodied speedster and not a washing machine-powered job either. This one was very healthily pushed by a 30.50 cubic-inch Triumph motorcycle mill.

Since that time Roger has put together progressively hairier pieces of going machinery, winding up with his present '32 "high-boy" roadster which is a piece of equipment that is indeed wooly.

Starting out as a street roadster about two years ago, the car has undergone quite a number of changes, the latest being the addition of a 310 cubic-inch Merc, replacing the 296 cubic-inch job that powered the car through the traps at 118 at the Salinas drags.

Basically this mill is a '41 Merc block stroked to 4¼ inches and bored .030 over 3⅜ inches. Weiand heads provide a reasonably conservative 8 to 1 compression ratio and a four carburetor manifold by the same manufacturer dumps the fuel in large quantities into the ports. These selfsame ports have been gouged out to take 1¾ inch intake and 1⅜ exhaust valves, both Chrysler products. A Potvin 425 Eliminator cam does the jiggling. All this push is delivered through a Friction Master clutch to a 25-

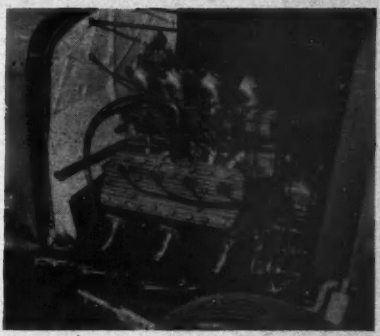
Owner Hardcastle ticks off the points of his high-boy deuce to Associate Editor Dick Day. The line-up of trophies gives mute evidence to the roadster's dragging prowess.



tooth Lincoln transmission and thence to the Halibrand center section and the rear end. Heat is exchanged, not by a radiator, but through use of a 15-gallon tank in the rear deck.

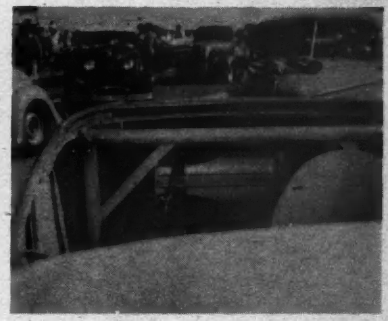
The whole car was lightened through liberal application of a drill to nonstressed components—in fact, it whistles. What else can you say about a roadster that purely *goes?* Next stop, Bonneville.

Photos by E. Rickman and B. Southworth



Big bore Merc is sparked by a Harman-Collins magneto. Note the absence of radiator.

Regular '32 rear spring has been discarded for a Model A spring and tube crossmember.



Deck of the roadster has been liberally sprinkled with holes. The tank is for water.

TORCH TIPS

by Dick Day

Photos by Felix Zelenka

Solid Hood Side Panels

SINCE this month's second series on Customizing the MG deals with a subject that is closely related to customizing any car of '29 to '37 style (the MG hasn't changed basically in design since the early thirties), we will substitute the story for our regular "Torch Tip" feature. It is not too often in this modern day that we can dig up a complete step-by-step feature on cars of this vintage but when we do, we feel that the importance of such a story to the owner of such a car is equal to the stories of later models that we cover with greater frequency.

To the early-model enthusiast, solid hood-panel installation is the equivalent of the nosing and frenching done on the later versions. The effect achieved is much the same—that of a more solid, compact look.

In this case you will notice that the sides were not left solid but were relouvered in a different pattern, quite often a more effective touch than the absolutely plain solid sides. Far from being a major task, solid panels can be easily constructed in your own back yard with a minimum of tools.

1. Hood's hinge pin is easily removed by attaching to a drill chuck, and steadily pulling to the rear while pin revolves.

2. Lay side panel on solid surface and straighten one hinge roll perfectly flat.

3. 18 gauge sheet metal was used to make new panels. Lay old panel out with hinge rolls close to edge. Allow about 1/2-in. for step-beading that will be put in later.

4. With a tri-square, scribe off all hinge points and the entire contour of the panel.

5. Cut panel from sheet metal and have a metal shop break edge for step beading.

6. Cut all vertical scribed lines with tin snips. Matching the old panel for removal of every other flange, chisel a break line.

7. Remove every other flange by twisting with pliers. File and true-up all edges.

8. Since the size of the flanges is a little long, it will be necessary to take the exact measurements of the stock panel's flange and now mark new flanges identically.

9. Scribe the exact flange length with tri-square, then cut tips off with metal snips.

CONTINUED ON NEXT PAGE

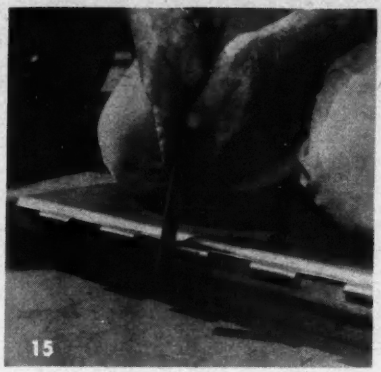
10. Place panel on the edge of an object with the hinge pin in a position as shown, then start to bend each hinge flange over.

11. Continue curling each of the flanges around the pin with a hammer and dolly.

12. Ends of the flanges are tucked under by this screw driver and hammer method.

13. Hinge pin can be removed as before by attaching drill and pulling as pin revolves.

14. After removing hinge pin, fit new panel to top of the hood, checking hinge fit.



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15. If some of the hinge flanges are slightly wide, mark them and then file edges to fit.

16. Insert hinge pin rod with drill method, and check over-all fit to body and fender.

17. Once panel fits correctly, next step will be to spot braze a 1/8-in. rod to bottom edge of side panel for stiffness.

18. After rod has been attached at various intervals, braze solid and finish off edge.

19. When lower panel edge is completed, refit and install old panel's hood latches.

17

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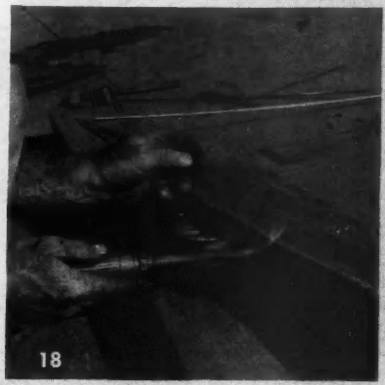

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CONSERVATIVE

Bob Travers' lemon yellow Ford is easily recognizable as such, although the vintage is considerably disguised through careful frenching and blending of all components.

The interior of the car received a full but conservative upholstery job of white and black plastic in the original Ford styling.

The rear end of the car has received only minor shaving, removal of deck ornaments and bumper guards. Lights will be changed.

WAS THE THEME

IT'S nice to have a show-stopping custom car and it's even nicer to have a car that garners the "Oh's" and "Ah's" of an admiring audience, but after all, a fellow has to be able to drive the thing around and in the San Francisco Bay area this means that the radical approach is out.

Bob Travers, a resident of Oakland, California, has been a custom car owner several times over. Ownership of this nature begets experience so when Bob decided to put together another custom the approach was strictly utility; but this utility was coupled with immaculate workmanship and the top notch help provided by Walt's Custom Shop, to produce a real show stopper. Basis for all the work was a '50 Ford convertible.

All seams were frenched as were the headlights. The car was lowered a conservative three inches fore and aft and equipped with a very custom grille set in a radiator opening similar to that of a '50 Merc. Louvered skirts were set over the rear wheels and all wheels equipped with wirewheel hubcaps. Topping off the whole affair is a brilliant lemon yellow lacquer job rubbed out to a mirror-like finish. Under the hood nestles an almost stock engine equipped with an Iskenderian ¾ cam and an Edelbrock dual intake manifold. Here, too, conservatism was the theme.

Looks like it pays off.

Photos by Eric Rickman

BUILD A HOT IGNITION

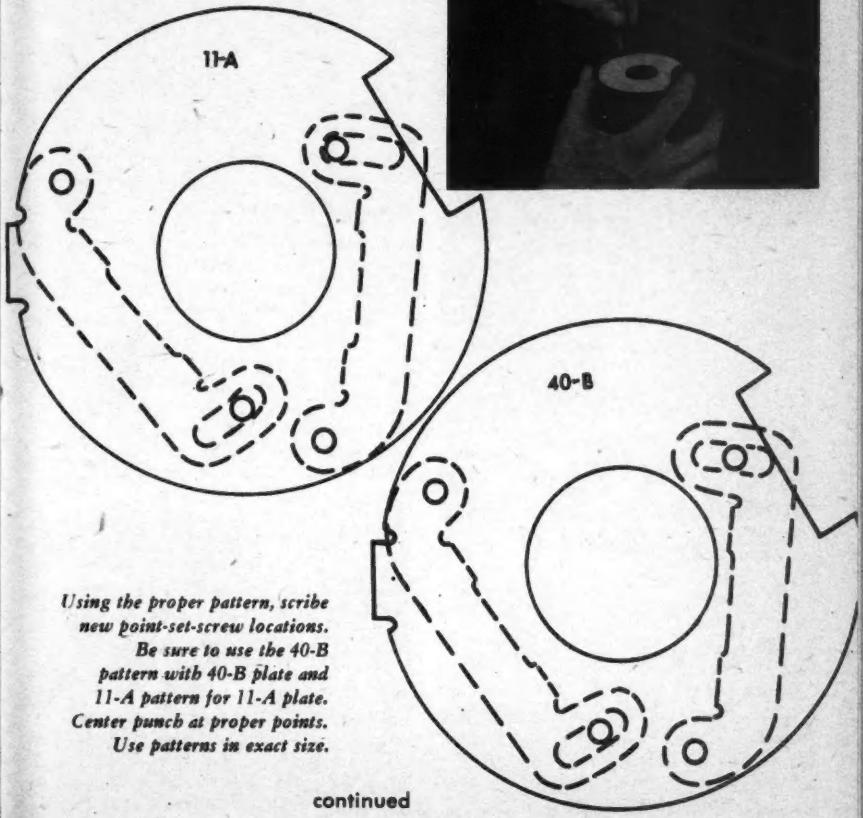
CONCLUSION

Breaker Plate, Synchronizing and Final Assembly

IN THE last two installments we discussed modifications to the distributor cam, case and terminal plates. With these modifications in order, you should be ready now for the final operations on the breaker plate.

In this concluding installment we cover the breaker plate, synchronizing and the final assembly of your new hot ignition. Now you can bolt the unit on the front of your engine and GO!

With drift punch remove the stock fulcrum pins and eccentric screws. Back the breaker plate up with the vise to prevent bending of plate.



Using the proper pattern, scribe new point-set-screw locations. Be sure to use the 40-B pattern with 40-B plate and 11-A pattern for 11-A plate. Center punch at proper points. Use patterns in exact size.

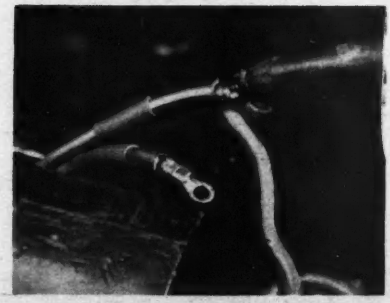
continued

Hot Ignition continued

Using a #27 drill (9/64"), drill center punched locations. There are four holes to be drilled in either plate.

An 8-32 tap is used for installing new threads in newly drilled holes. When tapping is finished, chamfer tapped holes with a 1/4" drill. By using this large a drill, the rough edges of newly tapped holes can be readily removed without cutting into threads. Easy does it at this point—a touch of the drill will do the job.

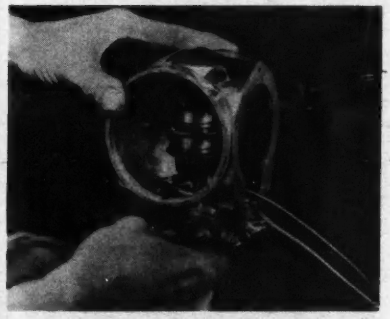
With drilling and tapping operation completed, check by holding a steel-rule or similar straight-edge across the face of the plate to see if the plate is warped or uneven. File flush if uneven and polish if so desired. Install the plate in proper place in the distributor base. If a loose fit is encountered, gently peen edges of plate until a snug fit is encountered. This enables the points to retain their original settings.



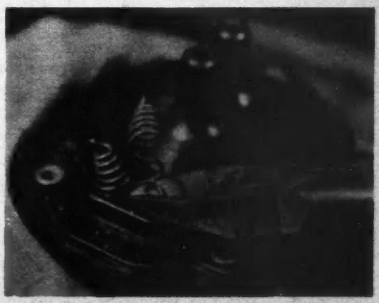
New condenser-to-magneto points wires are of 16 gauge wire cut in 2 lengths of 10" each. Terminal ends are soldered to ends of wires which will be attached to magneto points first.

Points used for this conversion are available at local automotive electrical shops, garages or from parts houses. Parts number for this Bendix-Scintilla magneto point (2 necessary) is 10-52344 W. Cost is $1.75 for each set. Note in photo proper wire installation. Using shake-proof type washers, with a flat washer of approximate size on slotted end of point, install points onto points plate. Set points at .011 at this time.

Using small rat-tail file, widen breaker plate set-screw hole in slot cover plate to within 1/16" of side on which calibrations are stamped.



Feeding wires through case at the same time base assembly is installed, assemble unit as shown. Install breaker plate set-screw at this time. Main distributor components are now ready for synchronizing. For detailed instructions on this procedure, see end of story.



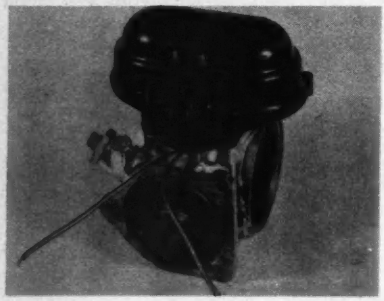
With synchronizing completed, the Lincoln-Zephyr coil, if checked and found acceptable, may now be altered to fit new distributor assembly. Remove brass springs with a pair of diagonals. These springs were originally the source of voltage for the stock Lincoln-Zephyr points. After removing springs, cover with rubber cement and place a piece of electrical rubber type tape over cavities.

CONTINUED

Hot Ignition continued

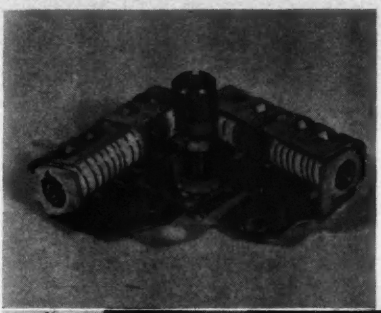
Remove any corrosion with narrow bladed screw-driver, and insert new Lincoln-Zephyr carbon brushes and springs.

Insert small piece of sponge rubber, or weather stripping, into slot cut for points-to-condenser wires. This aids in keeping out moisture from rain, car washing, etc.

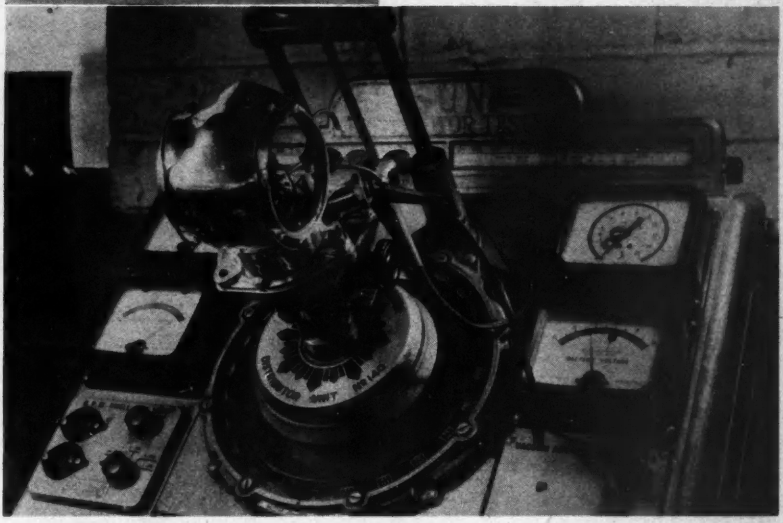


Place coil in proper location, checking to see that wires are not pinched between coil and case, also to see if carbon brushes are in proper location, and clearance for rotor is a sufficient distance from carbon brush housings.

Form wires so they will fit between condensers and coil. Cut to proper length and solder wire terminal ends of appropriate size for condensers to ends of wires. Install Lincoln-Zephyr condensers with coil retaining screws firmly in place.



The Lincoln-Zephyr coil was manufactured for the use of resistance units, which in this case are two Ford coil resistors joined together as shown in photo to make up unit, which lets both coils get an equal amount of voltage. The main distributor lead is fastened to the center lug, which joins the resistors. Unit is fastened to coil by using two 8/32 nuts.



Completed distributor is now ready for the test of all tests at the local drag strip. *(Note: More than one minute in LOW gear not recommended by this writer, for this test!)*

SYNCHRONIZING

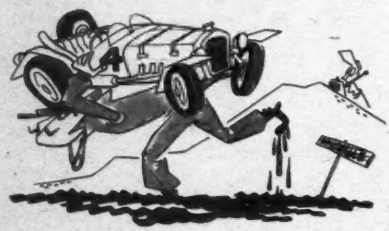
This type distributor is synchronized without coils attached. The operation should be done by a tune-up man who is thoroughly familiar with a stroboscope. When checking any distributor, always make sure the operating battery's voltage is within range displayed by instrument in photo, which reads Battery Voltage. Using hot lead from the strobe, which is attached to a condenser, fasten lead from the condenser to one of the protruding wires. Check for resistance, then remove lead from mentioned set of points and attach to other set and check for resistance. If the points plate is snugly fit into the base, good grounding, or no resistance, should be evident. If resistance shows, check points for cleanliness and screws for tightness until cause of resistance is located and altered.

Again set points at .011 for initial testing. The converted distributor retains its left-hand rotation. With the breaker plate set-screw firmly tightened, start rotating motor in left-hand rotation, and adjust distributor rpm which is half engine speed, at 250 rpm. Placing the "0" or Zero degree indicator

(Continued on page 62)

Have a Bash! continued from page 43

no two patterns alike. Keep one objective or motto in mind, and that is, "the element of surprise." There is no limit to the length



. . . position the checkers on high ground so that they have good observation points.

that a section should be, but keep it to a happy medium. You definitely need, and should plan, the section so that the checker who is logging point penalties has high ground for a good observation point. For instance, the starting checker will be positioned at the entrance of the section with his stop watch setting the participants off—if the section should run up the side of a hill and continue down the other side and then circle and return over the top again, finishing up approximately at the start—you would place a checker at the top of the ridge and in turn he would do the complete checking because he would be able to follow the participant through every move from start to finish. The checker starting the participant would only be required to keep time on him from the time he started 'til he reached the finish, which he could easily see (see diagram B). If by chance a section of the observed area was obscured, then it would necessitate dividing the section into what is called sub-sections, and arrange checkers for each sub-section. If this is necessary, then clearly explain to checkers what his or her section constitutes so that they will not check past their designated sections, and into the following checker's area (see diagram C).

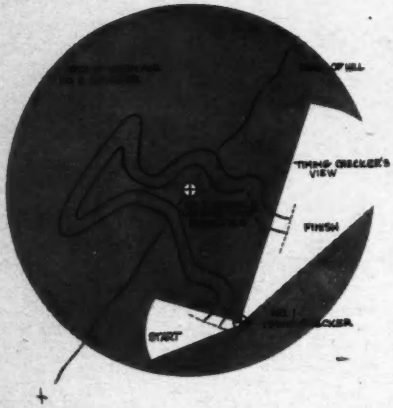


Diagram B

In this type of a section only two checkers will be needed. One to serve as the starter and keep elapsed time logged, and another on high ground to observe the participants throughout the observed section for penalties that may occur.

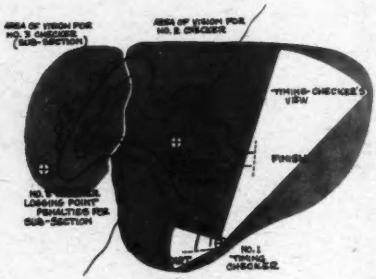
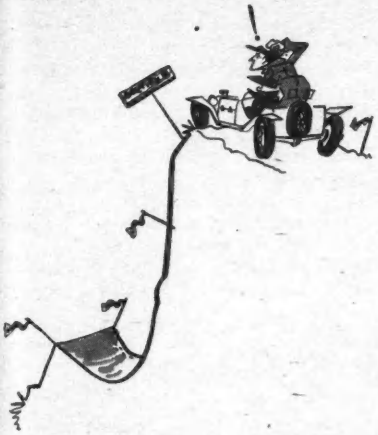

AREA OF VISION FOR NO. 3 CHECKER (SUB-SECTION)
AREA OF VISION FOR NO. 2 CHECKER
TIMING CHECKER'S VIEW
FINISH
NO. 1 TIMING CHECKER

Diagram C

This section is practically identical to the one in diagram B, only it has an area that is obscure to the No. 2 checker. In this case you will need a third checker to check this sub-section, as it is called. The boundaries of his sub-section have to be explained thoroughly so that he does not check past them and into the No. 2 checker's section. He can keep his own score sheet or report the points lost to the No. 2 checker, whichever is the best.

Testing Sections

Almost all types of terrain will lend itself to the course, but a few types like sand, steep hills, and mud or waterholes, should receive some consideration from the standpoint of being impossible to negotiate. You



. . . almost any type of terrain lends itself.

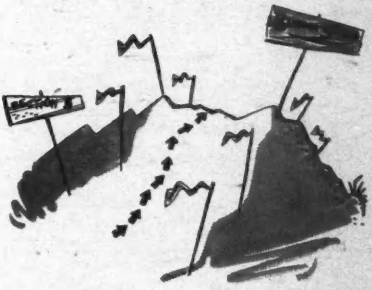
don't want any section to be so close to impassable that it necessitates constant use of the tow-truck for removing bogged-down cars, nor one that will become completely impassable from only a few runs of the initial starters. Throw in all the goodies of sand, hills and mud holes, but to make sure that it is possible to finish, select three to four different make cars from the course committee and run tests on just how easy or hard the section is to make with the various equipment. Do this with all sections and you automatically reach a fair and just section for all, no matter what equipment he may be driving. This method and only this method will determine how much and how deep the sand can be, what grade percentage the hills can be, and what will constitute a fair mudhole or water crossing.

Marking the Sections

When marking the sections it should be remembered that the participants are not allowed to walk or drive over the course before starting time, so the stake markings are

Participants are not allowed to walk or drive over course before starting time . . .

his only guide when negotiating the section. The best method used for staking the section is to use wooden laths or the same type slats that are used in snow fences. The stake's length should be at least 4½ feet after being driven in the ground. The stakes should be positioned about every ten feet and at the top of each stake tie a twelve inch streamer made of cloth or crepe paper. This will help outline the course. In past events of this type, string or small tape was strung



Odd-ball signs add humor to sections . . .

from stake to stake, actually outlining the section, but this system doesn't work out, for as soon as a car goes out of bounds while driving the section, he automatically takes the string with him, uprooting several stakes in the process, causing a large amount of unnecessary work in getting the section back in order for the next contestant. At the entrance of each section you should have a sign stating it as the start and what number section it is. Also at the finish of each sec-

(*Continued on next page*)

tion, post a similar sign, and if possible, an arrow pointing to the direction of the following section. If time allows, it's a great gimmick to add signs here and there at the sides of the sections with little warnings such as, "Hold on tight and don't stand up," or anything that will add some laughs along the way for the contestants.

SCORING

Now we come to the hard part. In any contest there has to be some method of determining who has done what and how well he's done it. This means scoring, which in turn means scorers, who, in turn, have to have something to go by. Following is a list of penalties garnered from English trials rules, bike trials rules and the one and only (so far) American trials. It works very simply . . . you goof, you lose points. The more you goof, the higher the score. The higher the score, the lower you are on the totem pole. Here's what you get:

For each second of elapsed time in each observed section: 1 point.

For knocking down course markers: 5 points for each marker.

For loss of forward motion: 20 points for each stop.

Reversing in the section: 10 points each time.

Passenger raising seat of pants from seat of car: 20 points.

Leaving marked course with all four wheels: 15 points each time.

Killing the engine: 10 points.

Failing to attempt any section (this is the *lowest!*): 250 points.

Failing to complete, or being towed from, a section: 200 points.

SCORE SHEET
SECTION NO. 3

CHECKER Jim

NUMBER OF CAR	FAILURE TO ATTEMPT (250) PTS.	FAILURE TO COMPLETE (200) PTS.	LOSING FORWARD MOTION (20 PTS.)	REVERSING IN COURSE (10 PTS.)	ILLEGAL POSITION OF PASSENGER (20 PTS.)	LEAVING COURSE (4 WHEELS) (15 PTS.)	STALLING ENGINE (10 PTS.)	PER MARKER (5 PTS.)	ELAPSED TIME IN SECTION	TOTAL LOSS OF POINTS
1			✓	✓				✓✓	56	96
2	✓									250
3						✓		✓✓✓	31	76

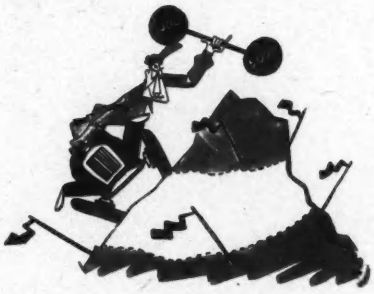
Diagram D

This type of a score sheet works out nicely. The checker logs the number of the participant and then a check for each respective penalty. When the participant is through the section he can ask the starting checker for the elapsed time of the entrant and also log it in its designated square at the end of the sheet. You will note that the No. 3 entrant has the lowest score which can be attributed to a fast elapsed time, even with the off course penalty. No. 1 entrant, on the other hand, has a slow elapsed time and penalties for losing forward motion and reversing which was probably due to slow speeds as the elapsed time shows. This is a typical example of how the points will deviate.

In addition to the above, complete disqualification is the result of speeding or reckless driving between sections or in any way endangering spectators or other con-

testants. Accepting assistance in the trap from spectators without the consent of a course official can and should be reason for disqualification or at least a loss of 500 or more points.

You can see by these rules that it pays to keep your temper in check and your foot out of the carburetor at trying moments. It also pays to keep your passenger in hand since, if he so much as raises the seat of his



He can lean or use body english as desired.

pants from the seat of the car (he can lean or use body english all he desires) you get docked 20 points for each such illegal elevation. The idea of this is to keep passengers from diving out of cars at inopportune moments.

In general, these rules are designed to make it just a little bit tough for everybody (*just wait'll you see the rules on trials cars other than stock items*—Ed.). The idea is not just to make it rough, though, but to make it fair for anybody no matter what kind of car he's using. It can also be seen that there may be a time when in the course that it pays to sacrifice points on one problem in order not to lose points on another one which might carry a heavier penalty. In other words, it might be wiser to knock down two or three course markers and make a tight turn rather than to stop, back up and make a second run. The course markers will cost you 10 to 15 points but the backing and filling will cost a total of 10 for reversing plus 20 for stopping and losing forward motion plus a point for every extra second the maneuver takes to complete.

This makes the driver think before he acts. You can't get out of it without losing *some* points, so you have to do it in the way that'll give you the least number.

Now that we've got you all fired up to go out and storm through the swamps and over the hills, we've gotten ourselves morally bound to give you the dope on how to stuff a car together that'll give you the least amount of grief in coming to grips with the trials course. Next month we'll gather up the details and give you the plans and a few ideas and suggestions on building a trials buggy. We'll keep two objects in mind; cost and availability of parts. For power we strongly recommend that you study Chuck Eddy's and Les Nehamkin's breakdown of the Ford Four in this issue. If you happen to have any old Model A Ford parts kicking around, don't let 'em go—you may find a good use for them after reading the next issue. See you then!

INDUSTRIAL DYNAMITE

(*Continued from page 20*)

proved exhaust system, covered in this issue. We must caution against the use of tubing of too large diameter when fabricating exhaust headers. An important link in the *tuning* of the exhaust system occurs *before* the gases reach the muffler inlet pipe, and both size and shaping are important.

The two larger sizes of intake valves were recommended on the basis of proper matching with the cylinder displacement used. We wish to point out that each cylinder of the 172 JD engine has 3.3 cubic inches *more* displacement than the Lincoln and needs the 2-inch intake valves. In the case of the 134 JE engine, cylinder displacement is near that of the '54 six cylinder and thus the 1.78 inch diameter valves recommended should prove adequate. Stock exhaust valves, EAF-6505D should be lightened and polished and the ports beneath cleaned and polished. If any doubt exists concerning the adequacy of these stock valves, substitute 52-54 F-8 exhaust valves, which are probably also more expensive.

(*Continued on page 65*)

BUILD A HOT IGNITION

(Continued from page 57)

ring on the point of one of the flashes, check to see if the four flashes now registering on the degree wheel are an exact 90 degrees apart. This will show accuracy of cam. If flashes are within one degree of being 90 degrees apart, cam is acceptable. With the "0" placed at any one of the indicating flashes, switch the lead from the condenser to the other set of points. Flashes should be 45 degrees from the original set tested, and still 90 degrees apart. If flashes now indicate from 0 to 5 degrees on either side of the 45 degree mark, the point setting now being used may be altered in gap to bring flash to the exact mark. With flashes now 45 degrees apart, stop strobe rotating motor and check gap in points. If points vary only .001 to .003 in gap, but are in synchronization, initial advance may be next operation. If points vary more than this, remove one set and elongate set screw holes in the points, allowing a shifting of one set to find the proper synchronization location.

With proper synchronization of the points themselves located, and the point gaps plus or minus .001 to .003 of each other, check to see if points are still close to the desired .011 gap. Minimum point gap is .007, maximum gap being .014.

One of two settings may be made, either the initial, or maximum advance. The desired method is to adjust the strobe rotating motor to the point where the advance or centrifugal weights are at full advance which is approximately 2000 distributor rpm, depending on weights used, loosen the points plate set screw, adjust flashing arrow to the number of degrees full advance desired. For most street jobs 22 degrees full advance is satisfactory. For competition and fuel-burning machines, 24 to 28 degrees may be desirable, depending on compression ratio, etc.

If a certain amount of initial degrees are desired, adjust flashing arrow, while rotating motor is at 250 distributor rpm. Note: If slight fluctuation, or an extra flash is noticed on strobe while distributor is revved up, this is caused by a rough cam or too narrow or large point gap. It may be necessary to remove cam and polish to a smoother finish, or alter point gap.

LIL' BEEP

By Dick Day

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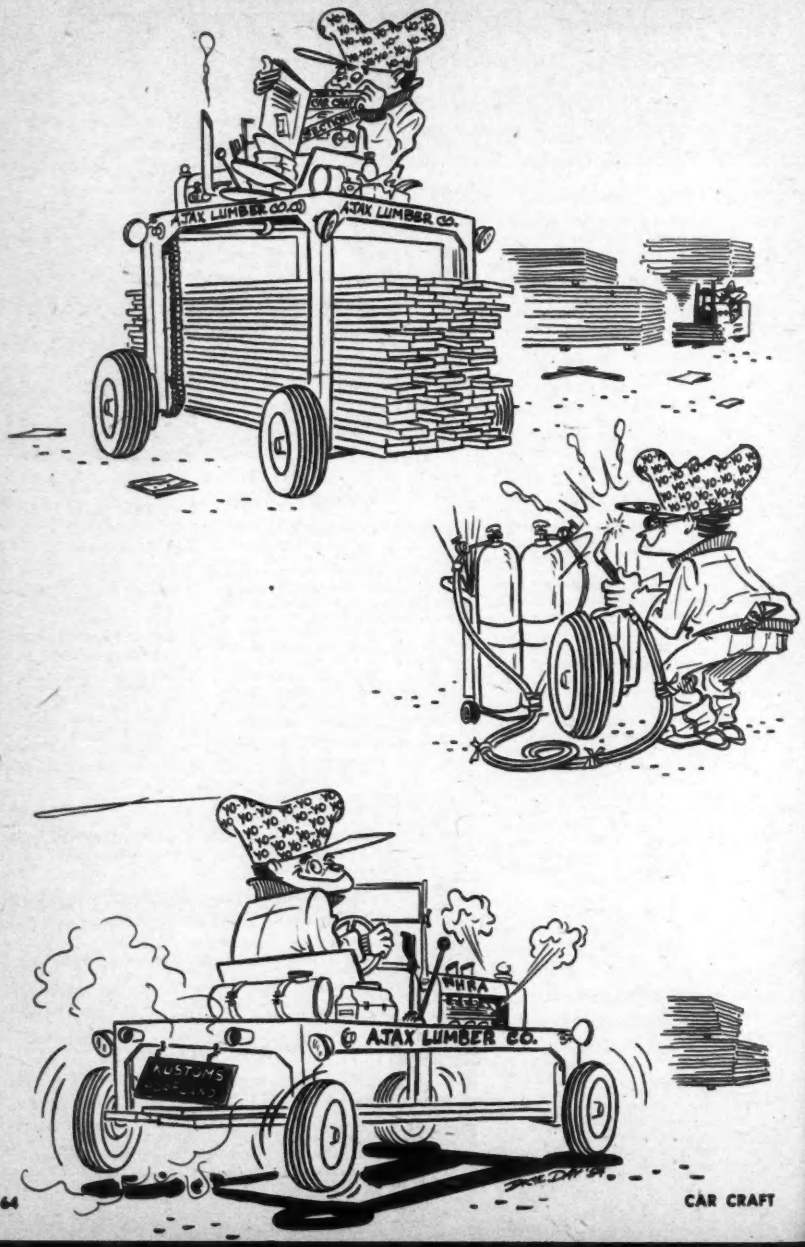

INDUSTRIAL DYNAMITE

(*Continued from page 61*)

Recommendations for head milling are based on an approximate method which will produce satisfactory results. This method assumes that a line drawn between the *centers* of the intake and exhaust valve heads will cross the dividing web between them at a point representing the *average* chamber depth. Measure depth to this point from the head surface, preferably with a depth micrometer and mill off proportionally, as given in the table. Both end chambers should be measured and any discrepancy in depth corrected in the milling procedure. If you desire to actually measure the volumes, try using a 100 c.c. graduate with ordinary table salt, instead of oil. It's far less messy!

Some interesting complications arose when we attempted to calculate the amount to be milled off to obtain the recommended compression ratios of 8.5-1 and 8-1. As the same head, EAE 6085E, is listed for both engines, the compression ratio with the JD 172 would be much higher due to the much greater displacement of each cylinder. However, the compensation factor *seems* to be the additional volume in the chamber of the 172 produced by its pistons being about ⅛ inch below flush at top center. This extra volume should be allowed for by milling off ¼ of the average chamber depth instead of ⅛ of its depth.

Any compression increase *in an engine of this bore size* will require considerable care in the smoothing and equalizing of all chamber volumes. If tulip-head valves are used (as in our photos) allow for some compression loss by allowing an additional .010 inch mill.

Manifold, Carburetion and Ignition

Results surprisingly satisfactory may be obtained by inverting the stock manifold and utilizing a single down draft carburetor of proper venturi size. Some acceleration tests with the completed installation may be necessary to establish the most satisfactory jet sizes. Variation in the power jet size and power jet spring tension is another good approach to final mixture for all ranges. We hasten to add that inversion of the stock manifold places the exhaust outlet flange very near the generator and a longer belt and lowering the generator outward may gain enough pipe clearance. Use of the stock item, however, is only makeshift, and we advise perusal of Les Nehamkin's masterpiece as a solution to the "feeding" problem of these babies. Use of dual carbs should be made with considerable discretion. The '52-'53 6 cylinder glass-bowl Holley has a 1¼ inch venturi and should serve admirably for the JE MK II. The JD MK II deserves as much fuel as half a Lincoln, so the larger '54 6 cylinder EBP 9510 of 1⅜ inch venturi should be used in dual installation. We have no prejudices against the use of side draft carburetion of either the straight Zenith or Carter types, or the angular S.U.'s, as on the Jag. Some difficulties may be experienced with mixture changes on hard right turns with the side-draft installations, but we have had similar goofs out of some downdraft rigs.

An interesting variation might be obtained through the use of two V-8 60 carbs modified to operate progressively. This is accomplished by cutting the throttle shaft in each carb base to make each butterfly on the lever side open as a primary system. Linkage is then arranged to operate the butterflies on the opposite sides as a secondary system, a la 1953 Lincoln. Both sides should empty into the manifold directly above the head port, exactly as though each carb was a single throat. The objective in using this system would be to obtain better acceleration by use of minimum venturi sizes for any given condition. If additional reader interest is shown in this advanced system of carburetion, we might persuade "Ye Olde Creake Editor" to let us give you more fascinating coverage. (*He's the conservative—not us.*—Ed)

Stock ignition employs centrifugal advance weights which we feel will not do the job for utmost flexibility. However, the stock distributor produces 29° to 31° on the JE and 26° to 28° on the JD engine. These figures include the initial advance of 8° on the JE 134 and 5° on the JD 172. It is questionable whether either engine would require additional advance, if modified as we have recommended. However, knocking under load might require manual retard which would rob us of power in the higher rpm ranges.

(*Continued on next page*)

INDUSTRIAL DYNAMITE

(Continued from preceding page)

The solution to this problem (which is one of flexibility) is a load-control to automatically retard the ignition timing, but only under load. Either the vacuum-retard, centrifugal-advance type (like Delco or Auto-Lite) or Ford's own Loadamatic type from the passenger car might be adapted. Take your choice, but we prefer the Loadamatic for its added flexibility. Magnetos might be adapted, but without the automatic-advanced types some performance loss will be experienced over the wide rpm range required for a sports car engine. Manually-controlled types are generally out because the driver is a little too busy to select proper advance while wheeling our little monster through the sinuous bends of a road course. The 1952-54 six cylinder distributor could be most easily adapted for this job by pressing off the regular six-lobe cam and pressing on either a four-lobe cam or a reground eight-lobe job from a late ignition. This could be modified by grinding as shown in the Hot Ignition article in April '54, CAR CRAFT. Because the bore in the block which accepts the 4 cylinder distributor is larger than the six-cylinder distributor shank, a small sleeve adaptor about 2 inches long will center the conversion. To drive the conversion in the proper direction, the driven gear off the 4-cylinder rig should be pinned to the lower part of the six distributor shaft with care. See that the oil pump will be properly driven when the conversion is finally installed.

Crankshaft

Construction is of molded nodular iron as in the rest of the Ford family. Main journals are a husky 2½ inches diameter and rod journals 2¼ inches, as on the six cylinder. What appear to be slugs of iron between the throws are in reality hollow-cast boxes to stiffen the shaft with no sacrifice in lightness. If any alteration of reciprocating weights has been done, by all means re-balance the shaft.

Clutch and Transmission Options

Standard equipment consists of a 9 inch clutch on the "134" and a 10 inch size on the "172." If desired, the 10 inch assembly could be easily adapted to the "134." Clutch housing, JE-7501A, adapts the passenger car three-speed transmission to either engine. If the center-shift transmission is desired, it may be adapted through use of standard Ford parts. If serious competition is anticipated, adaptation of either an MG or Jag 4 speed transmission is not difficult. In fact, this has already been done in one case and we may elucidate later.

DREAM STUFF

If the foregoing tale of the attributes of these hairy monsters arouses your imagination, hear me now! Serious work has been done on a blown version of these engines, incorporating fuel injection! Outputs of over one h.p. per cubic inch are attainable, and at a favorable weight figure for the complete power plant. We hope something big will come of these investigations as many enthusiasts and competitors, alike, sometimes resent the Battle of Inches, no matter how convincing! May we hear the throaty roar of these "factory-built Cragars" with a high-pitched supercharger whine in the background?

Camshafts

This most controversial item might serve well in its stock form. Being gear-driven rather than chain-driven, it revolves opposite to the six cylinder cam. However, the same cam followers EAA-6500D and push rods, EAA-6565C are used. These mushroom followers allow lift at the valves of over .400 inches with a properly ground cam and high-lift rockers. Ford will make tubular pushrods available in the near future which will fit *all* engines in the line, *except* the '54 Ford V-8 and Mercury. Slight surgery will make use in these two V-8's very simple! For maximum output and durability, we definitely recommend the use of a billet camshaft and the stock mushroom followers. The stock shaft is a shell-moulding and not to be trusted after grinding to the usual lobe shapes.

In conclusion, we feel that these engines offer tremendous potential for conversion or original installation in a home built sports car. What they lack in inches, they tend to make up in weight saving and a flat torque curve which can easily be boosted above the limits of most of the better foreign jobs.

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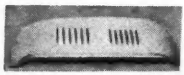

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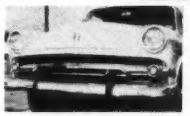

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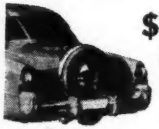

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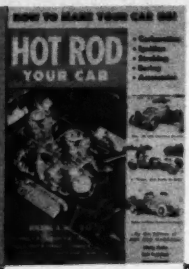

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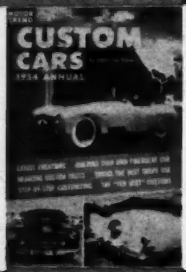

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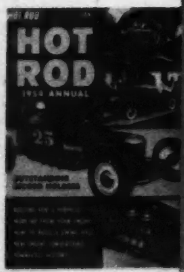

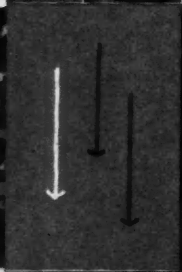

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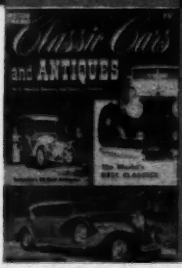

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